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USSR Report

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No. 1343

DEVELOPMENT OF USSR FOOD PROGRAM

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AGRO-ECONOMICS AND ORGANIZATION

INTRODUCTION TO REVIEW OF THE FOOD PROGRAM

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 3-5

[Unattributed introduction: "Industry and the Food Program"]

> [Text] The continuous supply of the people with the high-quality food products requires good work both by agriculture and many other sectors. For precisely this reason the 26th Party Congress has felt it necessary to prepare and incorporate in the five-year plan a comprehensive Food Program.
>
> The compiling of such a program is to the highest degree creative and, we must admit, complex. It should bring together the efforts in agriculture itself, in the industrial sectors servicing it and in the systems for procuring, storing, processing, transporting and trading agricultural products. What is particularly important, it should subordinate the work of all the designated sectors to the overall ultimate aim of meeting the nation's needs for food.
>
> In compiling the program one must carefully work through the structure of the agroindustrial complex and eliminate the discrepancies existing in it.
>
> L. I. Brezhnev.
> From the speech at the November (1981)
> Plenum of the CPSU Central Committee

Considering the complexity and importance of the question, the Politburo of the CPSU Central Committee has proposed that the Food Program be discussed at one of the regular plenums of the party Central Committee.

Around two score ministries and departments control the interrelated elements of the food complex. These include: The Ministry of Agriculture, Ministry of Food Industry, Ministry of Meat and Dairy Industry, Ministry of Procurement, Ministry of Fruit and Vegatable Industry, Tsentrosoyuz [USSR Central Union of Consumer Societies], the Ministry of Land Reclamation and Water Resources, the Ministry of Tractor and Agricultural Machine Building, the Ministry of Machine Building for Animal Husbandry and Fodder Production, the Ministry of Mineral Fertilizer Production, the Ministry of Rural Construction and others.

The solution to the food problem has a clearly expressed intersectorial and interdepartmental nature and for this reason it is essential to create a system which would provide for the planning, management and financing of all elements of the APK [agroindustrial complex] as a single whole. The first steps have been taken in this direction. The Comprehensive Program for Scientific-Technical Progress and Its Socioeconomic Consequences for the Period Up to the Year 2000 provides an overall concept for the development of the APK and its food section and the directions of scientific and technical progress and the necessary structural changes have been established.

The 11th Five-Year Plan is the first stage in carrying out the Food Program. In the state 11th Five-Year Plan somewhat more resources are to be channeled into the development of the sectors supplying agriculture with the means of production as well as ensuring more complete processing and safekeeping of the agricultural products. Capital investments for the development of storage facilities are to increase by 1.6-fold and for constructing intrafarm hard-surfaced roads by 1.4-fold. In reviewing the situation in agricultural machine building, the November (1981) Plenum of the CPSU Central Committee set the task of raising the technical level and increasing the reliability and durability of the machines.

It is also important to see one other aspect. The work on the program and its implementation will make it possible to institute new forms and approaches in managing the production complex as a single whole and to find new methodological solutions in the planning of agroindustrial production. In the process of working out the Food Program an important place has been given to analyzing trends and problems and to forecasting the development of the sectors and the intersectorial ties.

We have asked the TsENII [Central Economics Scientific Research Institute] under the RSFSR Gosplan to provide in a unified form certain results from the forecast and analytical studies on the Food Program being done at this institute together with other organizations. These results are reflected in the articles offered to the readers.

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AGRO-ECONOMICS AND ORGANIZATION

STRUCTURE, MANAGEMENT OF FOOD PROGRAM REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82] pp 5-18

[Article by V. P. Mozhin, Academician of the VASKhNIL, Doctor of Economic Sciences and Chairman of the Council for Studying the Productive Forces under the USSR Gosplan (SOPS) and E. N. Krylatykh, Doctor of Economic Sciences from the Chair of National Economic Planning of the Economics Faculty at the Moscow State University imeni M. V. Lomonosov: "On the Elaboration of the Food Program"]

[Text] The Accountability Report of the Central Committee to the 26th CPSU Congress states that on the question of improving the standard of living "the task of bettering the supply of food for the population has moved to the forefront.... In the aim of a radical solution to the problem, it is judged essential to work out a special Food Program."

A large number of ministries, departments and institutes is involved in working out the Food Program. An active role is also played by the USSR Academy of Sciences and the VASKhNIL [All-Union Academy of Agricultural Sciences imeni Lenin]. The plans of many scientific research institutes for 1981-1985 envisage the carrying out of special research related to the elaboration of the program. The coordinated work by many organizations depends upon a uniform understanding of the essence of the Food Program, its immediate and ultimate aims, structure as well as the ways of elaboration and control of its fulfillment.

Why Is a Food Program Essential?

The specific comprehensive programs are a method for rapidly solving the most complex intersectorial national economic problems. What is the essence of the food problem? The methodology of systems analysis uses the concept of a "problem" to designate the presence of a substantial discrepancy between the desired and actual state of a system.

In the case of food, the desirable and the necessary mean a dependable food supply for the population of all the nation's regions on a level corresponding to rational consumption standards considering solvent demand.

The trajectory for the development of the food complex over the last 15 years has been characterized by a drawing nearer to the rational consumption level (see the table). A sufficient food supply has been achieved in terms of caloric intake. Per capita consumption (from 1965 through 1980) rose from 41 to 57 kg for meat, from 251 to 314 liters for milk, from 124 to 238 units for eggs, from 72 to 93 kg for vegetables and from 28 to 34 kg for fruits. We have almost achieved rational consumption standards for vegetable oil and fish. Per capita consumption of bread, potatoes and sugar exceeds the rational standards.

Consumption Dynamics for Basic Types of Foodstuffs (Kg per Year per Capita)

Name of Commodity Groups	Recommended Standards	Actual Consumption Level			
		1965	1970	1975	1980
Meat and meat products	82	41	48	57	57
Milk and dairy products	405	251	307	316	314
Eggs, units	292	124	159	216	248
Vegetables and melon crops	146	72	82	89	93
Fruits	113	28	35	37	34
Vegetable oil and margarine	9.0	7.1	6.8	7.7	8.6
Fish and fish products	18.2	12.6	15.4	16.8	17
Grain products	110	156	149	141	139
Potatoes	97	142	130	120	112
Sugar	40	34.2	38	40.9	42.2

The recommended standards are given in the book by V. F. Mayyer, "Uroven' zhizni naseleniya SSSR" [The Standard of Living of the USSR Population], Moscow, Mysl', 1977, p 102.

However, the food situation is still far from the desired. A substantial lag survives in the consumption of a number of food products behind the rational level: for meat by 35 percent and for fruits by 66 percent. This is one facet of the problem. Another is the instability in the supply of the public with meat-dairy and fruit-vegetable products in many regions of the nation as well as seasonal declines in the availability of food products. In recent years, there has been a drop in the increase rate of the sales of certain types of food through retail trade. For example, the average annual growth rate of sales in the Eighth and Tenth Five-Year plans was (in %): 5.4 and 3.1 for butter; 10.1 and 4.6 for eggs; 10 and 7.2 for vegetables; 10.8 and 2.8 for fruits and berries; 9.8 and 1.1 for milk and dairy products.

The slowdown in the increase of the products sold to the public has led to a decline in the average annual increase rates of per capita consumption. For example, in the Eighth and Tenth Five-Year plans these averaged for the year: 6.1 percent and 2.1 percent for eggs; 2.7 and 0.9 percent for vegetables; for meat, milk and fruits there was no increase in per capita consumption over the Tenth Five-Year Plan.[1]

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[1] "Narodnoye khozyaystvo SSSR v 1980 godu" [The USSR National Economy in 1980], Moscow, 1981, pp 7, 247.

One of the reasons for the existence of the food problem is the disproportions between the three major elements of the food complex: the production of agricultural raw materials, the capacity for processing it and the development level of the production infrastructure. The consequence of these disproportions is the loss of both raw materials and end product. The state of private subsidiary farms also has a definite impact on the food situation. Here over the last 15 years milk production has declined by 6.6 percent while in 1980 meat production stabilized at a level of 4.6 million tons and for eggs 21.6 billion units.

The rapid growth of the public's monetary income has brought about increased solvent demand for foodstuffs and under the conditions of unstable supply this has led to a desire to hoard product, that is, to purchase amounts which exceed the real current demand of a family. The migration flows for food have intensified from the small towns into the larger ones where there is a more dependable supply and a more diverse assortment of products. A tendency has appeared for an increase in the free market prices, particularly for milk, dairy products, vegetables and fruits. Let us add to this the increased imports of foodstuffs and the growing foreign trade deficit for this group.

The coming development of the national economy will largely be determined by what ways and means the food problem will be solved and by what time. A level of prosperity based upon a rational diet for the population is not only a goal of economic development but also by feedback is a factor of economic growth commensurable in its significance with the factors of scientific and technical progress. For this reason a solution to the food problem must be viewed in a unity of two aspects, that is, as a major social task and as a factor of economic development.

The food problem and the necessity of its rapid solution have determined the most radical way for concentrating the forces and resources, that is, the elaboration of a specific comprehensive program (TsPK) "Food." This is a range of socioeconomic, production, scientific research and economic organizational tasks and measures which are coordinated in terms of resources, dates and executors and aimed at solving the food problem. The Food Program is an addressed, directive document. The measures envisaged in the TsKP should be given priority in resource supply.

The Goals and Structure of the Food Program

The main advantage of a program approach to solving the food problem is in the specific structural reorganization of the food complex. Its aim is to solve the basic social task, to formulate new proportions, to ensure a balancing of the plans and thereby achieve a rise in the national economic effectiveness of the APK.

The Food Program is in the category of specific programs, that is, it includes the establishing of end-goal parameters. The correct choice of the goals is of fundamental methodological significance. The structure of the program, the composition of executors, the amount of resources and the time of implementation depend largely on this.

As in any vast undertaking, in solving the food problem it is essential to establish the goals of the immediate and more distant future. The report of comrade L. I. Brezhnev at the 26th CPSU Congress clearly stated that the goal of the Food Program is "in the shortest possible time to solve the problem of continuous supply of food product for the public." Stable food supply means evening out the seasonal drops, eliminating the acute scarcity of certain types of food and reducing the losses in trade and storage. Having solved this primary task, it is essential to aim at the more distant goal of ensuring a well-balanced, rational diet for all categories of the population, in all regions of the country and in all seasons of the year.

What can serve as a quantitative expression of such an end goal? We propose that this should be the parameters of scientifically based rational consumption differentiated according to the sex-age and professional groups of the population, for the regions of the nation considering their natural-climatic conditions as well as for the level and structure of solvent demand.

In long-range planning practices, rational standards of per capita consumption are employed, however they are not ascribed the role of a specific plan indicator. Within the Food Program, however, the use of these indicators as a specific goal function is completely essential and natural. In detail, the end goal of the Food Program is presented in the form of satisfying the needs of the population for the most important nutrients: proteins (animal and plant), fats, carbohydrates, minerals and microelements. The specific types of food products act as the carriers of nutrients. They also comprise the list of concrete specific standards in the Food Program and to a decisive degree determine its structure.

The extreme complexity of the entire food complex as a material object for realizing the program has necessitated the establishing of various levels of subprograms in the TsKP "Food." In any program there always are two basic components: the goal and the means. The subprograms are also divided predominantly into specific and supporting.

We propose establishing in the TsKP "Food" several major specific subprograms (TsPP) which correspond to the basic types of end food products. The development of the corresponding production subcomplex of the APK becomes the means for carrying out each subprogram. These subcomplexes include: meat-dairy, fruit-vegetable, grain product, beet sugar, fish product, oil-fat and certain others. In addition, it also makes sense to establish in special subprograms the production of nonalcoholic and alcoholic beverages and the production of untraditional types of food.

In each such program the specific indicators should be:

1) The volume of end product going for the personal consumption of the population (the product should be represented in a group assortment in physical or standard-physical indicators);

2) The volume of product sales through state retail and cooperative trade (in physical and cost terms);

3) The increase in reserves and stores (in physical and standard-physical units);

4) The degree of achieving the rational consumption standards (in percent of the rational level broken down for the Union republics).

Since the carrying out of the Food Program is planned for a period of several five-year plans, such indicators in the specific subprograms are given for each 5-year period.

The special measures of a support nature are component parts of the specific subprograms. For example, in the meat and dairy subprogram, such specialized support subprograms should be established as "Breeding" and "Special Transport." A special word must be said about the subprogram "Feed." Its solution depends on a whole group of sectors. The program measures should include: an increase in the share of feed grain in the gross grain harvest; expanded plantings of corn, soybean, peas, barley and oats as well as industrial production of protein supplements. For fundamentally changing feed production it is essential to significantly increase the output of machinery and equipment for the combined feed and microbiological industries.

The establishing of groups of concrete measures in the specific subprograms makes it possible to give them a clear address and to determine the composition of the ministries responsible for carrying out the measures at the designated dates. In essence, each specific subprogram is a long-term plan for the development of a group of sectors which are technologically interconnected into a single process of producing a certain type of product. Such subprograms become the real basis for detailed development plans of the sectors comprising the production complex.

Certain important measures are part of several specific subprograms. This applies to the production of general-purpose tractors and agricultural machinery, to the production of mineral fertilizers and plant protection agents, to the development of construction facilities, to the building and operation of roads in rural localities, to material-technical supply and product sales through the trade and public dining system. The program measures for the structural elements common to the entire production complex must be set apart into general purpose support subprograms. Each of these should include more detailed subprograms.

We feel that it is essential to establish at least the following general purpose subprograms: "Investments," "Scientific Research," "Personnel," "Increasing Soil Fertility," "Mechanization and Automation of Production," "The Use of Chemistry," "Roads and Transport," "Storage," "Crating and Packaging," "Product Sales," "The Development of the Private Subsidiary Farms," "Foreign Economic Ties and Foreign Trade," and "The Development of the Social Infrastructure in the Countryside." The concentrating of assets within the subprograms will ensure the necessary structural shifts and the balancing of production in the food complex.

Each general purpose subprogram should determine its own measures related to the end goal. This means that the end-goal orientation is a common principle in establishing the program decisions. For example, it is important not only and not so much to increase the production of mineral fertilizers as it is to improve their structure by raising the share of phosphorous fertilizers. It is essential to radically alter their quality and produce more granulated fertilizers as well as fertilizers with set conditions for releasing the nutrients. This will directly aid in increasing the harvest yield. The support subprograms with their comprehensive implementation create a basis for carrying out the product specific subprograms.

The Food Program contains as its main element the accelerated production of new technologies in all elements of the agroindustrial complex. The new technological solutions are needed for more fully extracting all the valuable components from the agricultural raw materials, for preserving the products in all stages of their movement to the consumer, for lowering the material, labor and energy intensiveness of production as well as for broadening the assortment and quality of the end food product.

The nation is allocating significant resources for the Food Program, the first stage of which coincides with the 11th Five-Year Plan. The allocating of them to the product subcomplexes and the support subprograms should be subordinate to the single aim of most fully satisfying the needs of the population with maximum effective use of the resources.

Managing the Elaboration and Implementation of the Program

The managing of the elaboration of the Food Program, in being carried out by the USSR Gosplan, includes the coordinating of efforts by the developers and the preparation of procedures for establishing the program measures, calculating the needed resources and the effectiveness of their use.

The main danger which lies in wait for the developers of the program is a formal approach to its compiling where the sectorial projections coming from the achieved level are merely added up. The elaboration of a true program should start with the precise formulation of the end goal and run through definite levels of its achieving by periods to the allocation of resources between the sectorial and territorial elements of the production complex in the aim of their dynamic balancing.

Such an approach to the elaboration of the Food Program is possible with the presence of the following:

1) An interrelated system of program indicators;

2) Scientific and technical forecasts;

3) A system of scientifically based standards;

4) A set of mathematical economics models for multivariant calculations.

It is important to concentrate the procedural work precisely in these elements of program management.

In addition to the already-mentioned specific indicators for satisfying demand, the system of indicators for the Food Program must incorporate indicators for the production volume and distribution of end product in a product range adopted in the state plans and, in a number of instances, also in the sectorial plans. For all the subprograms, another group of major indicators is production efficiency, capital investment effectiveness and product quality. Also of essential significance is the group of indicators for scientific and technical progress, particularly for the introduction of new technologies, equipment, materials and forms of production organization. A significant group of indicators in the program is indicators of resource support, including the training and allocation of personnel, reciprocal deliveries of raw materials between the agricultural and industrial sectors as well as the supply of energy, materials and equipment.

The Food Program is among the capital intensive. But, the allocating of capital investments for this program is strongly limited by the even more capital intensive fuel and energy complex, the metallurgical sectors and transport. For this reason the most important for the entire program are the general indicators for the volume and allocation of investments to the sectorial and territorial elements of the production complex and the completion of production capacity and projects, including by reconstruction and modernization. Directly related to this group are the indicators for the support of the investment subprograms in terms of capacity of construction organizations, building materials and equipment to be installed.

In the Food Program a special group is made up of indicators for conservation measures and the rational use of natural resources, primarily land, water and the food resources of the forests, seas and oceans. Among the indicators there are also those which perform specific functions, for example the normative-technical and metrological support for the program studies. Since the USSR food complex has extensive foreign economic ties, the system of the program's indicators also includes the planned volumes of foreign trade turnover and areas of scientific and technical cooperation.

Finally, a definite and important role must be played by indicators relating to improving management in the sectors and intersectorial elements of the food complex, in particular the introduction of ASU [automatic control system] and the creation of production associations, including agroindustrial and trade-agroindustrial.

A few words must be said about mathematical economics modeling of the food complex. Its extreme complexity necessitates the constructing of a system of mathematical economics models. In our opinion, here the central place should be held by a model of the intersectorial balance and the model for optimizing the structure and development rates of the food complex. These two central aggregated models must be correlated to the more particular and detailed models for the development of the food subcomplexes (grain, meat-dairy, fruit-vegetable and others) as well as the territorial elements of the APK.

The qualitative level of the Food Program will depend upon the reliability of the scientific and technical forecasts. Such forecasts carried out within the Comprehensive Program for Scientific-Technical Progress and Its Socioeconomic Consequences for the Period Up to the Year 2000 should lie at the basis of the elaboration of the Food Program. They must also be employed in calculating the "expenditure-output" coefficients for the mathematical economics models.

Controlling the implementation of the TsPK "Food" represents a rather complex problem since around two score Union and Union republic ministries and departments are involved in the organizational and managerial structure of the food complex. Some of them belong to just this complex alone, for example, the recently created Ministry for Fruit and Vegetable Production, the Ministry of Meat and Dairy Industry and the Ministry of Food Industry. The ministries of agriculture, fishing industry and procurement, the Main Administration of the USSR Council of Ministers for Microbiology, the Ministry of Machine Building for Animal Husbandry and Fodder Production, the Ministry of Land Reclamation and Water Resources and others to a significant degree are also part of the food complex. Each of these ministries and departments should bear full responsibility for carrying out a certain range of program measures. However the basic task is to coordinate their actions. For carrying out this function it is essential to have a body which has been granted the powers and resources. In speaking at the October (1980) Plenum of the CPSU Central Committee, Comrade L. I. Brezhnev emphasized that without a well organized system for managing the program, it inevitably would be turned into a total of good intentions. In order that this does not occur, in the very development stage it is essential to adopt and realize a system for managing the program.

In principle, it is possible to have different variations for setting up such a scheme and coordinating body, for example, the establishing of one of the ministries which is part of the food complex as the coordinator. This could be the Ministry of Agriculture or the Ministry of Food Industry. Another variation would be to create a special Committee for Food under the USSR Council of Ministers. A third would be to have the recently organized Administration for the APK of the USSR Gosplan carry out the coordinating functions. The fourth would be to organize a permanent Food Council the members of which would be first deputy ministers of all the sectors involved in the food complex. Each of the variations has its own positive aspect and shortcomings. As was said by Comrade L. I. Brezhnev at the 26th Congress, "the improving of the organizational structures of management will not tolerate delay. It is impossible to adapt the living, developing organism of economic management to the established, customary forms. On the contrary, the forms should be brought into conformity with the changing economic task."

The management of the food complex is precisely such a developing organism. Since in its very essence this complex is a multisectorial one, it is impossible to manage it using the traditionally derived sectorial forms. We should find forms of intersectorial management on all levels. However, of equal importance is the management mechanism as a whole. The reconciling of interests on various levels and their general orientation to the end goal--this is what comprises the basic properties of such a mechanism.

Of particular significance are the long-term contracts between the agricultural and industrial enterprises and which closely define the volume, assortment, quality and delivery dates of the product as well as contracts between the enterprises (associations) in basic production and the production infrastructure. A large amount of work remains to be done in the area of improving price formation for the products of all sectors in the food complex.

This is the first time in our nation that a Food Program is being worked out on such a scale. In addition to its basic purpose of solving the food problem, it will provide much for the development of scientific research and for the interaction of research institutions. This very valuable experience must be analyzed and generalized for use in subsequent work.

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PROBLEMS, IMPROVEMENTS IN MEAT, DAIRY INDUSTRY EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 19-31

[Article by Candidate of Economic Sciences A. D. Nastenko, section head at the Central Economics Research Institute under the RSFSR Gosplan in Moscow: "The Meat and Dairy Subcomplex: Development Problems"]

[Text] The meat and dairy national economic subcomplex should be viewed as consisting of the following: feed production, including the combined feed and microbiological industries; livestock raising; the meat and dairy industry; the trade in meat and dairy products; machine building for feed production and livestock raising; machine building for the meat and dairy industry.

The end product of the subcomplex is: the various types of meat and dairy products, eggs, leather and fleece raw materials, wool, down and feathers. The latter are employed as raw materials in the subsectors of light industry.

The intermediate products of the subcomplex include: the various types of feed, including combined feed and feed additives; the various types of livestock and poultry in live weight; the machinery and equipment for livestock raising, feed production and the meat and dairy industry.

The basic aim of the program measures determining the directions, pace and proportions of development in the interrelated types of production of the subcomplex is the maximum satisfying of the demands of the Soviet population for end product. An inseparable part of the program is increased efficiency in the functioning of the complex as a whole and this is judged from the end results, that is, the achieving of the goal with the most efficient use of the national economic resources assigned for the subcomplex.

The 26th CPSU Congress defined the basic areas for the development of the APK [agro-industrial complex]. By 1985, there are plans to bring average annual meat production up to 17-17.5 million tons (in dressed weight), milk to 97-99 million tons, eggs to at least 72 billion units and wool to 470,000-480,000 tons. At the enterprises of the meat and dairy industry, from the raw materials of the state resources, meat production (including first-category subproducts) in 1981-1985 will increase by 34 percent and the production of whole milk products (recalculated in terms of milk) by 14 percent.

Increased Productiveness of Livestock Raising

A characteristic feature in the development of livestock raising over the years of the Tenth Five-Year Plan has been the increase in the number of head. In 1976-1980, the number of head of cattle increased from 111 to 115.1 million, or by 3.7 percent; for pigs the figures increased from 57.9 to 73.4 million head, or by 26.7 percent; for sheep and goats, from 147.1 to 147.5 million head, or by 0.4 percent. As a whole the number of head of livestock in the USSR has reached a significant amount and in 1980 was 155.5 million cattle units or 0.59 cattle units per inhabitant of the nation. In recalculating into cattle units, the structure of the herd has been taken into account and for this all the young animals are reduced to the adult number of head in terms of the number of feed-days. This is significantly more than in other countries with developed livestock raising. However, the productiveness of livestock raising in our nation is low. Thus, the average annual milk yield per cow in the USSR during 1970-1980 rose from 2.110 to 2,143 kg, including up to 2,223 kg on the nationalized farms, but in such nations as the United States, Japan, the Netherlands and Sweden, the yield was 5,000-5,800 kg.

In recent years in our nation, there has been a certain increase in the meat productiveness of cattle. The average weight of one head of purchased cattle has increased from 256 kg in 1965 to 350 kg in 1980. The purchases of superior condition cattle have risen by more than 4-fold.

In determining the primacy of factors which determine the increase in productiveness of livestock raising, a rise in the feed level should be put in first place. Per cattle unit, there are 26-28 quintals of feed units instead of the 40-45 quintals spent on the leading farms of our nation and abroad. The overall low level of feeding substantially increases the share of so-called support feed, as a result of which the share of the productive part of the feed is low. Ultimately, this leads to increased feed consumption per unit of product. Thus, there is a real opportunity to increase the per-cow milk yields up to 3,000-3,500 kg with the existing breed composition of the dairy herd. A changeover to balanced feeding will make it possible to substantially reduce the proportional feed expenditures and on this basis save 50-70 million tons of feed units in terms of the 1985 production volume as well as substantially lower the capital intensiveness of maintaining one head of livestock and producing a unit of livestock product.

One of the ways for increasing the nutritional components contained in livestock products is to improve its production structure. Due to the fact that the greatest lag in comparison with a rational standard is observed in the consumption of animal protein, an increase in protein production can be set as a criterion for assessing the optimality of the production structure for livestock products. An optimum structure of end food product manufactured from livestock raw materials should ensure the accelerated growth of animal protein consumption and bring this up to the physiological standard considering consumer preferences with the most efficient use of the material-raw product, labor and financial resources.

Calculations made using the model for optimizing the long-range development of livestock raising and feed production in the RSFSR have shown that under the conditions of limited labor resources (the given resource is the scarcest), the most effective, along with milk, is the production of eggs, the protein of which has the lowest aggregate labor intensiveness. Meat production is less effective from the standpoint of expenditures per weight unit of protein. At the same time, the greatest lag in consumption behind the physiological standard has developed for meat. This circumstance requires the fundamental development of meat livestock raising. One of the ways for solving this problem is to improve the structure of meat production.

As is known, the expenditure of feed, labor and material resources on producing a unit of the different types of meat vary. Thus, according to the standards approved for 1985, feed consumption per quintal of beef dressed will average 15 quintals of feed units for the USSR, and this is approximately 1.7-fold more than for producing 1 quintal of pork and 2.2-fold more than for 1 quintal of poultry meat. Because of this, in the 11th Five-Year Plan and beyond it it is essential to consistently carry out a course of more rapidly developing poultry raising as one of the most efficient livestock raising sectors. The technology of poultry reproduction as well as its rapid growth make it possible to substantially increase the share of poultry meat even in the 11th Five-Year Plan. The amounts which make it possible to ensure the ubiquitous and uninterrupted sale of poultry in the system of state and cooperative trade should be the guideline determining the growth rate of poultry production and its share in total meat production. As the shortage is eliminated, the production of other types of meat should develop more rapidly.

In determining the zonal structure of meat production it is essential to be guided by the structure of feed production. In the grain-raising areas, the production of poultry meat and pork should be predominantly developed. In areas with a sufficient amount of hayfields and pastures, preference should be given to cattle and sheep raising.

Increasing the Balance and Quality of Feed, Increasing Its Production

The successful development of livestock raising is directly dependent upon solving the feed problem.

For ensuring high productiveness of livestock raising, the feed rations should contain per feed unit: 100-140 grams of digestible protein, 90-120 grams of easily hydrolyzable carbohydrates, 180-220 grams of cellulose (for ruminants), 8-10 grams of calcium, 5-6 grams of phosphorus and 30-40 mg of carotene. During the Ninth and Tenth Five-Year plans, per feed unit there was only around 90 grams of protein. According to estimates of specialists, the protein shortage in the diet of the animals during this period was at least 5-6 million tons. In 1978, 37 million tons of digestible protein were consumed for livestock feed with a requirement of 43 million tons. A particularly large overconsumption of feed due to its protein imbalance occurs during the stall period of keeping the livestock. If the feed protein imbalance which developed in the base period were to persist, then this would lead in the 11th Five-Year Plan to the overconsumption (calculated for the 1985 production volume) of around 70-80 million tons of feed units. This amount of feed would be sufficient to produce 5 million tons of dressed beef and increase per capita meat consumption over this period by 18 kg.

The solution to the protein problem is possible both by the means of agriculture as well as by the accelerated development of the industrial sectors which produce the high-protein feed supplements.

Over the coming 10 years, more than 60 percent[1] of the grain resources will go for feed purposes and the task of the most efficient use of feed grain will become a primary one. Up to now, approximately two-thirds of the grain has been fed to the livestock and poultry in the form of grain mixes which are imbalanced in terms of protein, vitamins and other nutrients. Calculations have shown that the processing of all grain to be used for livestock and poultry feed into balanced combined feed will increase the efficient use of the feed grains and all other feed by 25-30 percent. The use of grain as combined feed makes it possible to obtain an additional 2.5-3 million tons of meat.

The implementing of the measures outlined by the July (1978) Plenum of the CPSU Central Committee to increase combined feed production is being held up by the insufficient growth rate in the production of protein and vitamin additives by the enterprises of the microbiological, meat and dairy industries as well as fisheries. Here the reserves are enormous. From the industrial sectors the feed protein resources by 1985 can be increased by 2 million tons, or by 1.4-1.5-fold, including by 1.3-1.4-fold in the food industry and 1.8-1.9-fold in the microbiological. Moreover, the carrying out of measures in agriculture can produce 6-7 million tons. This will somewhat lessen the protein shortage in the feed balance but not fully eliminate it.

An analysis of the structure of the production and use of feed in the nationalized sector of agriculture shows a clearly marked trend for an increase in the share of concentrated feed (from 24.9 percent in 1965 to 37.2 percent in 1979) and a noticeable decline in the share of pasture feed (from 24.5 to 15 percent), hay (from 10.5 to 7.0 percent) and silage (from 16.6 to 11.3 percent). The changes occurring in the structure of the feed balance are undesirable and they ultimately are leading to an increase in costs, capital and labor intensiveness of livestock products as well as to a decline in meat and dairy productiveness. The choice of a rational structure for feed production is largely influenced by the shortage of labor resources and the presence of a sufficient amount of land used for producing plant feed. Under these conditions there should be predominant development of producing the feed which possesses the least labor intensiveness per feed unit (pasture feed, natural hayfields, perennial grasses, green bulk used for silage and haylage) as well as the feed grain crops.

The potential possibilities of the natural feed lands should be more fully utilized. At present, more than 42 million hectares of meadows and pastures are overgrown with brush and 7.6 million hectares are water-logged. It is essential to carry out reclamation work (eliminate the brush and carry out leveling) and create cultivated and fundamentally improved pastures. There is an urgent need to increase the production of machinery and equipment for performing technical jobs, for harvesting and preparing feed from the natural pastures as well as a substantial improvement in their technical and economic specifications. This will make it possible to overcome the trend which cannot be justified by objective factors for a rise in the cost of a feed unit obtained from the natural feed lands.

The production structure of the feed grain crops needs a fundamental improvement. In the USSR, the proportional amount of the high protein pulse crops in the plantings and production of grain crops is extremely low. In the Tenth Five-Year Plan, this was approximately 3.5 percent. In accord with the Basic Directions of Economic and Social Development, the average annual production of pulse crops in 1981-1985 should be brought up to 12-13 million tons, or to 5.2 percent of the total gross grain harvest. The economic mechanism should also be subordinate to solving this problem in order to create an economic incentive for producing high-quality feed grains, primarily crops with an increased protein content in the grain.

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[1] According to estimates of the Central Economic Scientific Research Institute under the USSR Gosplan.

Reducing Losses and Raising the Biological Value of Prepared Feeds

The greatest losses in the nutritional value of feed are observed in the preparing and storage of hay, haylage and silage. These can be avoided by shortening the harvest times (the preparing of haylage in the optimum vegetation phases makes it possible to obtain feed with a protein content of 120-140 grams per feed unit), by employing progressive methods for drying and storing the hay, by more widely employing chemical preservants and improving the feed storage conditions. The listed measures will make it possible to increase the nutritional value of the feed at the time of its consumption, in particular from 0.1 to 0.26 feed units for 1 kg of silage, from 0.28 to 0.43 for haylage and from 0.6 to 0.8 feed units for grass meal.

Each year the kolkhozes and sovkhozes receive around 220 million tons of straw, however less than one-half of it is employed for livestock feed. It is possible to significantly increase the nutritional value of straw by treating it with chemical agents. Here the digestibility of cellulose increases from 40-45 to 60-70 percent while the nutritional value of 1 kg of straw rises from 0.2 to 0.6 feed units.

Here we again encounter a problem which cannot be solved by the efforts of agriculture alone. We must have more productive machinery and equipment adapted to the zonal conditions and the deliveries of chemical preservatives to feed production must be increased. There should be a significant rise in the supply of the kolkhozes and sovkhozes with equipment for laying down silage, haylage and so forth. In other words, machine building, the chemical industry and construction industry should be involved in solving this problem.

Increasing the Level of the Technical Equipping of Livestock Raising and Feed Production

The spread of a modern form for organizing production, that is, livestock complexes which produce on an industrial basis, provides great opportunities for increasing milk and meat production and for raising its efficiency. At the end of the Tenth Five-Year Plan the nation had 2,120 complexes for milk production, 125 for raising heifers, 300 for raising and fattening cattle, 488 for raising and fattening pigs and 162 for raising and fattening sheep. But the proportional amount held by them in product output is still low, for example, 19.1 percent in pork production and 4.6 percent in the production of beef and milk. In the milk producing complexes productivity of the cows is 11 percent higher than on the farms, labor productivity is 76.9 percent higher and feed consumption is 8 percent lower per unit of product. Even more significant are the differences in the efficiency of meat production. Thus, in 1977, the average daily weight increase on the cattle raising and fattening complexes was 772 grams in comparison with 376 grams on the farms; here labor expenditures per quintal of weight increase were 5-fold lower and feed expenditures [illegible] percent less. As a result, the cost of 1 quintal of product was 33 percent less than on the kolkhozes and sovkhozes.

The period since the March (1965) Plenum of the CPSU Central Committee has been characterized by intensive growth rates in the mechanizing of labor intensive jobs in livestock raising, feed production and feed preparation. Over the last 9 years alone, a number of machines for feed preparation and other livestock needs increased by 55-150 percent, depending upon the type of machine (see Table 1). Here there has been a sharp decline in the number of implements which offer little mechanization or employ manual labor on the farms. While in 1960, just 15 percent of the total number of cows was milked mechanically in the nationalized sector, in 1979, the figure was 89 percent. Significant advances have been made in mechanizing such labor-intensive processes as feed distribution and cleaning the barns. Mechanization is also occurring rapidly in poultry and pig raising. But as yet only 39 percent of the number of head of cattle, 61 percent of the pigs and 69 percent of the poultry are in barns with fully-mechanized production processes.

Table 1

Amount of Machinery and Equipment in Livestock Raising at Year's End, Thousand Units

Machinery and Equipment	1970	1975	1979	1979 in % of 1970
Silage and straw cutters	85.4*	45.1	26.8	31.4
Feed mixers	28.9*	54.1	71.4	247.1
Milking units and rigs	195.3*	316.6	354.5	181.5
Cattle feed distributors	167.5	227.2	259.7	155.0
Pig feed distributors	19.8	31.5	35.7	180.3
Conveyors for cleaning barns	267.4	433.6	558.5	298.9

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* Date for end of 1971.

The program for the development of the meat and dairy subcomplex over the immediate future envisages the more efficient use of the potential possibilities of the livestock farms on the kolkhozes and sovkhozes. Here basic attention will be given to reconstructing the farms as this makes it possible to employ modern mechanized methods and increase the effectiveness of livestock raising.

Ensuring the Complete Processing of Meat and Dairy Raw Materials, Increasing the Output of End Food Product

An analysis of the present state of meat and dairy product output indicates the possibility of increasing the output of end food products from a unit of meat and dairy raw materials by reducing the losses of biologically valuable substances in the production and consumption sphere. The solution to this problem at the enterprises of the dairy and meat industry has its particular features. In the dairy industry basic attention should be focused on increasing the share of dairy protein going for food purposes. The existing production structure of dairy products does not correspond to the physiological standards for their consumption and does not ensure the rational use of the protein contained in the dairy raw materials.

According to the conditions for the production of dairy product, the use of the component parts of the dairy raw materials in them varies. All the raw material components are virtually completely incorporated in the finished product in producing whole milk, acid-milk product, canned milk products, cottage cheese and sour cream. In cheese production only the fat and protein are used and basically the fat in butter. Thus, of all the milk components, fat is most fully utilized and this is considered in the purchasing prices for the raw materials as well as in the wholesale and retail prices for the finished products and in the standards.

The use of protein basically depends upon the type of product to be turned out. If one compares the actually existing structure for milk processing with the recommended, one can see major reserves for increasing protein utilization for food purposes from this factor (see Table 2).

Table 2

Product Structure for the Production of the RSFSR Dairy Industry (recalculated for whole milk, %)*

Product	Actual in 1977	Recommended Consumption
Whole milk products	44.6	52.5
Butter	45.6	32.5
Cheese and sheep cheese	9.8	15.0

* Tables 2, 3 and 4 have been calculated by T. N. Tiginyan.

Regardless of the fact that the processing structure of dairy raw materials (see Table 3) has constantly been improved (in 1979, the share of milk used for producing butter declined by 16 percent in comparison with 1965), in drawing closer to the recommended, at the same time the share of whole milk products in 1979 was only 41 percent instead of 52.5.

An important area is the fuller utilization for food purposes of the secondary cheese resources such as whey, buttermilk and separated milk. The amount of these products in the dairy industry is great. Thus, in 1979, in the RSFSR alone, more than 17 million tons of separated milk and buttermilk were obtained as well as 5.5 million tons of whey; these contained 588,000 tons or around 58 percent of the protein in the initial raw material. Of this amount around 43 percent of the separated milk and 13 percent of the whey were employed for producing food and nonfood dairy products. The remaining secondary raw materials were returned in an unprocessed form to agriculture to be fed to livestock and used for technical purposes.

In the 1970's, in our nation, the tendency to produce products from skimmed milk became noticeable (see Table 4). However, with the large resources of this very valuable raw material, the demand for product with a reduced fat content or for non-fat products is not satisfied.

Table 3

Structure for Milk Utilization for Producing Dairy Products in USSR, %

Types of Product	1965	1970	1975	1979
Whole milk	28	38	38	41
Cheese, sheep cheese, dry milk, canned milk	7	12	13	10
Butter	65	50	49	49

Table 4

Production Dynamics of Product from Skimmed Milk in RSFSR, Thousand Tons

	1975	1980
Total product volume calculated for skimmed milk	905.1	1416.1
Including in physical terms:		
Non-fat cottage cheese	97.9	150.5
Non-fat cheese and cheese bulk	1.3	4.3
Non-fat acid milk product	121.7	239.0

Along with the secondary products of the dairy industry (separated milk, buttermilk and whey), each year livestock raising utilizes 12-15 percent of the gross output of whole milk for calf and piglet feed. In the United States and in a number of other nations, due to the broad use of whole milk substitutes (WMS), the consumption of whole milk for feeding calves equals 1.6-2.0 percent. Considering the real productiveness of the dairy herd in our nation, an increase in WMS production would make it possible to lower the consumption of whole milk for feeding young animals to 8 percent, having increased whole milk consumption for feed purposes by 4-7 percent. In recent years, the production of WMS has increased in the USSR. In 1970, 2,200 tons of WMS were produced, 85,400 tons in 1975 and 182,100 tons in 1979. However, with the high growth rate for the production of this product, its physical volumes do not satisfy the needs of livestock raising. Along with saving whole milk, increasing the output of WMS will make it possible to substantially smooth out the uneven deliveries of dairy products to the consumption sphere and to increase the resources of food products during the months with the lowest milk yields (February--April).

The wider use of progressive production methods in the food industry will make it possible to increase the output of end food products and reduce the losses of biologically valuable substances. Flow-line production of cottage cheese provides an opportunity to reduce fat losses (calculated per ton) by 14.7 kg while production costs are reduced by 68 rubles. The production of cheese in film makes it possible to mature rindless cheeses in lockers with a controllable air temperature without washing and relaying the cheeses. This leads to reduced losses in raw materials as well as lower labor expenditures and product costs. In recent years, a method has been developed for producing hard cheeses which are matured in a polymer film. The wide use of polymer wrappings in the ripening, storage and selling of cheeses reduces product losses in all stages by 7-11 percent.

An analysis of the production structure at meat industry enterprises also indicates that it still does not provide for the complete use of the raw protein and fat for food purposes. There are major losses of nutrients contained in the blood and bone and the nonfood wastes and confiscates are not sufficiently processed. The bone in a dehydrated state contains 40 percent of the protein and 18 percent of the fat. However, only about 20 percent of the bone undergoes degreasing. At the same time the demand for food bone fat used in manufacturing margarine, cooking fats as well as whole milk substitutes is not satisfied. A significant amount of meat is delivered to the trade network or public dining enterprises as carcasses or large sections and this leads to the incomplete use of the fat and protein contained in the bones. Up to 8 percent of the meat remains on the bones which are sent for processing purposes. The corresponding processing of the bones which would fully utilize the meat on them for food purposes is carried out in very limited amounts.

An important factor which protects the food products, reduces losses and increases productivity of social labor is the industrial packaging of the goods. The actual level of packaged food products delivered to the networks is something more than 40 percent. More than one-half of the goods are packaged manually in the work areas of the stores. The labor of approximately 400,000 persons is spent as a total on the packaging of food products in retail trade. Calculations indicate that in bringing the volume of food product packaging by industrial methods up to 75 percent it would be possible to save the national economy up to 20 million man-days. This corresponds to the annual working time fund of 66,000 persons. The capacity of the stores would be increased and this would equal the completion of an additional 1.3 million m^2 of floor space and the construction of this amount would require around 800 million rubles of capital investment.

The basic reasons for the slow growth rates of packaged food include: the lack of a material incentive on the part of the industrial enterprises to increase the output of packaged products, a shortage of production capacity as well as the low supply and quality of packaging materials. In the dairy industry, labor expenditures for the packaging of pasturized milk in bottles are 2-fold higher than for packaging in cans. The labor intensiveness of producing packaged dairy products (butter, sour cream, bulk cheese and cottage cheese) in comparison with the unpackaged increases by 1.5-2-fold. Although the economic effect from selling packaged products in trade is significantly above the additional costs for packaging in industry, nevertheless due to the prevalence of departmental interests the industrial enterprises have been extremely slow in increasing the production volume of packaged products. In working out the Food Program it is essential to make provision for an increase in the production of packaging materials (film, foil and paper) as well as a certain redistribution of wrapping paper in favor of the food industry.

Having in mind the industry which processes agricultural raw materials, Comrade L. I. Brezhnev, in the report at the 26th CPSU Congress, pointed to the need of "making provision in the five-year plan for a more noticeable increase in investments for the designated sectors." This task bears directly also on the meat and dairy industry enterprises. Ensuring the complete processing of livestock raw materials and raising the ready-to-use level will make it possible to improve the supply for the nation's population.

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AGRO-ECONOMICS AND ORGANIZATION

PROGRESS, PROBLEMS IN FISHERIES DEVELOPMENT TRACED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 32-40

[Article by Candidate of Economic Sciences B. N. Akimov, sector head of the Central Scientific Research Institute for Information and Technical-Economic Research in Fisheries, and Candidate of Economic Sciences A. N. Lifanchikov, sector head of the Central Economics Scientific Research Institute under the RSFSR Gosplan in Moscow: "The Fisheries Subcomplex; From the Fishing Grounds to Industrial Production"]

[Text] Fish products comprise around 8-10 percent in the nation's protein balance. To this it must be added that fish protein is more easily digested and assimilated by the organism. The food and commodity value of fish depends upon the fat content. Fish fat is assimilated by the human organism more rapidly and more completely than the fat of warm-blooded animals.

Scientific and technical progress in the catching and processing of fish as well as the development of the social division of labor have brought about the appearance of specialized production which forms the fisheries subcomplex. It includes: the shipyards and ship repair enterprises which service the fishing industry fleet, the fishing fleet, the refrigerator and other specialized transport, refrigeration vessels, packaging production, the production of fishing gear, fishing ports, enterprises involved in the reproduction of fish stocks and so forth. The ultimate goal of the subcomplex's development is to satisfy the demand of the public for fish and fish products of high quality and diverse assortment as well as the demands of a number of the national economic and industrial sectors for feed, technical and pharmaceutical products.

The fisheries subcomplex is linked with the other national economic sectors by reciprocal resource deliveries. Fisheries supplys its products to 58 sectors and in turn consumes the products of 83 national economic sectors. In 1980, fisheries received around 4 million tons of diesel fuel, 0.6 million m^3 of wood, around 0.3 million m^3 of lumber and other wood materials, 0.6 million tons of coal and so forth.

For the production of net materials, fisheries consume around 2,300 tons of cotton and cotton thread, 26,500 tons of silk capron, khlorin [a polymer fiber] and viscose. In addition to its own production, the fishing industry receives a large amount of netting materials (basically rope and cord products) from the enterprises of other departments. The salt and food industries deliver a significant portion of their products here (vegetable oil, tomato puree and so forth). In 1980 the fishing industry used around one million railroad cars to transport raw products, auxiliary materials and finished fish products. In turn, in 1980, fisheries delivered more than 550,000 tons of fish meal, around 600,000 tons of feed fish and crushed shell for the needs of livestock and poultry raising as well as a large amount of products (medicinal and technical grease, agar-agar, alginates and so forth) for the medical, chemical, pharmaceutical, textile and other national economic sectors.

In terms of the wealth and diversity of raw material resources, the USSR fisheries subcomplex has no equal in the world. Its successful development is predetermined by a number of favorable factors. Our nation possesses the world's largest and uniquely productive inland bodies of water, these are the Caspian, Azov and Aral Seas. It also has an enormous number of lakes and rivers. We border on two of the largest centers of world fishing: the North Atlantic and the Northwestern Pacific. Both these areas produce one-half of the world's fishing catch.

As a total in the bodies of water exploited by USSR fisheries there are over 1,000 fish species including around 300 commercial ones. The present catch of fish and other sea products by all nations of the world is more than 70 million tons a year. The Soviet fishing industry is responsible for 12-13 percent of the world catch. Scientific data on the biological resources of the world ocean show the possibility of increasing the fish catch. This can be done in a significantly shorter time and with fewer expenditures in comparison with the agricultural production of animal protein.

We must particularly mention the need to develop mariculture in our nation. Mariculture is the raising of sea algae, invertebrates and fish under human-controlled conditions. Mariculture, as one of the areas of aquiculture, has undergone intensive development over the last 15-20 years. The world product of maricultures is around two million tons and, in the opinion of scientists, by the year 2000 it could increase by 5-10 fold. With the correct organization of production, the raising of maricultures can be more profitable than fishing in the world ocean. In the sea farms of the United States, Japan and Poland, the raising of fish and invertebrates is highly profitable production.

The USSR is working on the biotechniques to raise oysters, mussels and scallops in the Black Sea and the seas of the Far East. The first steps have been taken to cultivate marine algae and in particular to raise sweet blade kelp along the Murmansk coast and on the White Sea and Japanese blade kelp in the Maritime Area. In 1980, the total volume of mariculture in the USSR was around 40,000 tons and, according to the forecast estimates of scientists, over the 5-10 years can be increased to 200,000-500,000 tons. However, this requires a large amount of work to choose the rational objects for raising and the geographic zones for locating the market sea farms as well as for building various types of beds, enclosures of sea areas, for mechanizing the labor intensive processes in mariculture and so forth.

It is becoming particularly urgent to develop krill fishing and to use it for food purposes. The supplies of this Antarctic valuable crustacean are rather great (more than 100 million tons) so that it would be possible to significantly increase fishing without depleting its stocks at the same time. It is essential to re-equip a portion of the fishing vessels for krill fishing and the processing of it for food purposes, and not only for manufacturing "Ocean" paste but also pure krill meat and canned goods. Over the long run there are plans to create virtually a new subsector of the fishing industry operating completely on krill raw materials.

The high-powered super-trawlers of the "Gorizont" and "Prometey" class ensure the broad development of fishing for deep water fish in the open areas of the world ocean.

Along with the intensive development of oceanic and sea fishing, of great fishery importance are our inland bodies of water: the rivers, lakes, reservoirs and ponds. The techncial and economic potential acquired by the nation as well as the research of biological scientists have made it possible to eliminate the negative influence of industrial and urban construction on the inland bodies of water and to develop work in increasing their fish productiveness. The main thing is to fully implement the measures aimed at increasing the breeding stock of valuable commercial fish and to create conditions for expanded reproduction of the young fish with the ever-deteriorating conditions of their natural reproduction.

On the basis of strict scientific data, fishing has been limited and in some places even completely banned. The dates and months of fishing have been established, the fishing gear has been determined and the protecting of fishery bodies of water has been significantly strengthened. Sturgeon fishing has been completely banned in the Caspian and Azov seas as well as in the rivers of Siberia, the Amur and Baykal. Closed fishing seasons have been introduced on many rivers and lakes. In addition to the adopted measures, extensive research and practical work has been done on the reproduction of commercial fish stocks. The scientists have worked out the biotechniques for artificial reproduction and raising of the fish. All these measures have made it possible to gradually alter the nature of fishing on inland bodies of water. From open fishing it has more and more turned into the managed raising of fish on a commercial basis. Due to the work done by the fish farms, the acclimation and introduction of new valuable fish species into bodies of water, there has been a stabilizing of the catch and a gradual increase in it has commenced.

In 1980, the inland bodies of water of the nation produced more than one million tons of fish and this exceeds the 1950 level by 1.6 fold. The production of pond fish over this same period rose by approximately 30-fold and in 1980 was around 170,000 tons.

The development of market fish raising in our nation over the next five years will be insured by an entire range of measures to create a stable raw material base for producing high-quality products (live, smoked, cured, sun-dried fish and so forth) which is in increased demand among the population.

By the end of the 11th Five-Year Plan the catches in freshwater bodies and the production of pond fish will rise by 1.7-1.8 fold. This in turn will require a further expansion of the physical plant for market fish raising. This will involve increasing the stocks of the valuable species of fish in natural bodies of water broadening the production of high-quality fish stock on the pond farms and strengthening breeding and acclimation work. There are plans to develop fully mechanized lines and equipment for the processes of stocking the ponds, for loading, transporting and distributing feed, for raising aquatic vegetation, for aerating and preventive treatment of the ponds and for catching market fish. During the 11th Five-Year Plan we intend to build 65,000 hectares of new pond area, reconstruct and technically re-equip around 30 percent of the already existing pond facilities. One of the sources for increasing the output of pond fish will be an increase in the fish productiveness of the ponds up to 17.5 quintals per hectare in comparison with 10.5 quintals in 1980.

However, a rise in the production of market fish on an intensive basis is held up by the insufficient amount of granulated feed and chemical fertilizers which are supplied to fisheries by the combined feed and chemical industries. The degree of satisfying fisheries with granulated feed is around 30 percent and for chemical and mineral fertilizers, around 50 percent. The carrying out of the comprehensive specific program "Premix" which is being worked out by fisheries scientists for producing balanced feed and progressive feeding methods provides an opportunity over the next decade to reduce feed expenditures per unit of raised fish from 4-5 to 1.5-2.5 feed units with a simultaneous decline in feed costs by 20-30 percent. During the 11th Five-Year Plan, three plants will be put into operation with a total capacity of 150,000 tons of granulated feed. This will essentially make it possible to solve the problem of the feed shortage in the market economy. The same applies to the comprehensive specific program "Pond" which will resolve the problems of satisfying the need for chemical fertilizers for fishery requirements.

The development of market lake farms also has great prospects. According to recent estimates there are around one million hectares of lakes suitable for organizing fish farms. It is assumed that the lake farms by the end of the 11th Five-Year Plan will produce almost 37,000 tons of fish. This is almost 4-fold more than the present level of fish production from the lake farms. Market lake fish raising has advantages over the other forms of fish raising (for example, pond) because it does not require additional water resources and land and does not run into conflict with the other sectors which use water and land resources (particularly agriculture).

There will also be further development of the raising of fish in containers and pools, making it possible to bring the production of market fish closer to the major industrial centers. This will completely put it on an industrial basis, particularly if the level of mechanizing the labor-intensive processes is increased. The use of waste warm water from the TES and AES lengthens the growing season and makes it possible to raise fish in areas with unfavorable natural and climatic conditions. Trout is basically raised in the warm waters of the TES and AES. On an experimental level sturgeons (sturgeons and bester [a hybrid sturgeon]) are being raised and over the long run the brown bullhead and the buffalofish. Over the next 15 years there are plans to obtain up to 20,000 tons of such market fish (in comparison with 3,000 tons in 1980).

However, the scientific feasibility studies for raising fish in the warm waters of the TES and AES are far from complete. There is an increasing negative impact of industrial enterprises on the state of the fish stocks in the natural bodies of water and reservoirs while the unrecovered consumption of water and its pollution are growing. Considering this, in the immediate future it is essential to make provision to build and reconstruct fish farms on river and lake waters as well as carry out a significant amount of work to improve the spawning grounds on the large lakes and in the Volga-Akhtuba floodplain. There must be additional use of the unutilized water, the further broadening of work to acclimate fish and feed organisms, to improve the organization of fishing and make fuller and more rational use of the fish stocks. These measures will make it possible to increase the fish catch by 1.5-twofold over the next 10-15 years.

One of the most important tasks for the sector is to make effective use of the raw materials to produce food fish products and to fully process the wastes obtained in dressing the fish into fish meal for agriculture. During the 11th Five-Year Plan there are plans to raise the utilization of raw materials to 75-80 percent instead of 74 percent in 1980. The output of fresh and refrigerated fish will increase by 40.8 percent, for smoked fish by 12.3 percent and for air cured by 24.6 percent. The production of cured fillets will increase by almost 10 percent and culinary fish products by 16 percent. There is to be a substantial improvement in the assortment of canned fish produced by industry, primarily due to increasing the output of sardines, sprats and other canned fish in oil as these products are widely demanded. There will also be increased output of natural and other delicatessen canned fish products.

The production of fish food products over the long run is to be increased in the following areas:

1) By developing primary fish processing on the vessels with the complete use of waste products for meal as well as other food and special-purpose products;

2) By using raw materials of lesser market value to produce smoked and cured products as well as various canned goods and so forth;

3) By working out and introducing into production efficient methods for processing new products (krill, squid, algae) to produce high-quality food products from them.

There will be further development of production combining based upon the full use of raw materials using waste-free production methods where feed fish meal is made from the fish heads, bones and innards, medicinal and industrial greases from the liver, glue and pearl paste from scales and so forth. This will provide a significant economic effect. Production profitability of fish meal from wastes is 4-fold higher than in producing it from the whole fish. This is determined by the lower cost of producing fish meal from the wastes, due chiefly to the lower expenditures for raw materials.

The feed fish meal produced in the USSR contains 50-70 percent protein in addition to fat, cellulose, water, nitrogen-free extractive substances and microelements. Animals and poultry can assimilate 85-90 percent of the protein in the feed fish meal. Numerous experiments in studying the nutritional value of protein feeds indicate that a mixture of plant and animal proteins provides the best results. Peas and beans do not replace an equal amount of feed fish meal. In weight terms, 4-5 kg of feed fish meal produce around 2.7 kg of protein. For obtaining the same amount of protein it would be necessary to feed around 11 kg of beans.

The use of feed fish meal is effective. In the first place the productiveness of agricultural animals is increased. In feeding broiler chicks on combined feed containing 4 percent feed fish meal, the weight increase of the poultry per ton of feed fish meal increases up to 1.2 ton of poultry meat in live weight. In feeding laying hens a balanced feed containing 3 percent feed fish meal, the number of eggs laid for the hens increases by 16,700 eggs per ton of fish meal. In pig raising the use of 330 kg of fish meal balances 5.5 tons (in feed units). Secondly, as a result of obtaining the additional weight increases in feeding the feed fish meal, the time of fattening the animals is shortened. Thirdly, intensive fattening makes it possible to save on support feed for the same amount of weight increase.

Regardless of the increased output of feed meal from 8,500 tons in 1940 to 554,000 tons in 1980, the fish industry still does not meet the demand for it which has reached 1.5-2 million tons. Fish meal is a material-intensive product. The production of a ton of fish meal requires, as a minimum, 4-5 tons of raw material in the form of whole fish or fish wastes.

There must also be a further improvement in the method of manufacturing the feed fish meal. With the existing pressing method of production, its output and quality are significantly reduced, as the fat-free broths which are produced in pressing the thoroughly cooked bulk are not used. The broths obtained after the pressing of the cooked wastes, for example from ordinary fish, contain more than 5 percent protein substances. Considering that the broth output is around 60 percent of the bulk raw material, the protein losses, not counting the other valuable substances, with the pressing method are at least 3 percent of the bulk initial raw material. The output of meal can be increased with the pressing method by evaporating the broths (to a content of around 50 percent solid substances) and the subsequent adding of them to the cooked and pressed fish bulk in the drying process. In our nation the fish broths up to now have virtually not been used. The equipment in operation, particularly the shore fish meal plants, is obsolete. In design terms it is primitive, cumbersome and metal intensive and does not provide for the use of the press broths. Under the condition of their complete utilization (for this it is essential to produce the corresponding evaporation equipment), the output of feed meal on press units could be up to 21-22 percent of the bulk raw material instead of the presently obtained 17-18 percent. This would make it possible to significantly increase fish meal production.

One of the major areas for the development of fisheries is the creation of fish processing facilities at the points where the fish products are consumed. These are combines equipped in the last word of technology and designed for a daily output from 10-85 tons of a broad assortment of high quality culinary fish products in convenient small packaging. A number of such enterprises has been built and is in operation, for example, in Minsk, Volgograd, Donetsk and Kemerovo. The USSR Ministry of Fish Industry is broadening its control functions of the entire range of processes involved in the production and marketing of fish products, including the delivering of it under retail sales orders. For this, in the nation's fisheries, along with the construction of fish processing complexes in consumption areas, a system of large, modern equipped specialized firm stores, cafes and restaurants is being organized and developed. The nation has more than 130 specialized "Ocean" firm stores which popularize new types of fish products.

As a result of the increased production of food fish products, the per capita consumption of fish and fish products will increase from 17.7 kg in 1980 up to 18.2 kg in 1985, that is, it will reach the national consumption standard recommended by the Nutrition Institute of the USSR Academy of Medical Sciences. Over the next decade the catch of fish and sea products over the next decade is to rise up to 10-11 million tons.

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AGRO-ECONOMICS AND ORGANIZATION

PROSPECTS OF OIL, FAT INDUSTRY REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 41-47

[Article by Candidate of Economic Sciences V. I. Komarov, Director of Central Scientific Institute for Technical and Economic Research in the Food Industry, Moscow: "The Oil and Fat Subcomplex; Technical Progress and Complete Processing of Raw Material"]

[Text] The oil and fat subcomplex has come into existence with the development of the production of oil crops and the processing industry. Its task is to supply the national economy with the high-calorie and valuable substances: fats and proteins.

In accord with the recommendations of the Nutrition Institute of the USSR Academy of Medical Sciences, the daily requirement for all fats calculated per person is 97.5 gm, including 25.9 gm of vegetable fats. In excluding the fats of grain crops from the standard the consumption standard for vegetable oils will be around 9 kg per capita per year.

In addition to food needs, vegetable oils and the products obtained from them are used in various areas of technology. With the reduction in recent years in the use of vegetable oils for producing soap and boiled oils, their use has increased somewhat in the production of new chemicals (synthetic rubber, artificial leather, the tire industry, plastics and so forth). A significant amount of food and other scarce fats, oils and products from their processing is still employed as process lubricants, components and additives. Of the total quantity of vegetable fats processed by industry, 35-40 percent goes for technical needs. The replacing of this by synthetic substances will make it possible to release large resources of vegetable fat for producing food products. For example, the output planned for 1985 of 4.4 million tons of bread in forms treated with polymer materials excludes lubricating with vegetable oil and will save around 3,000 tons of this valuable product.

The population's need for vegetable oil and margarine products is virtually satisfied. However, the structure of the consumed products differs substantially from the recommended. The scientifically based consumption standards worked out by the Nutrition Institute of the USSR Academy of Medical Sciences for food products envisage a further decline in the consumption of animal fat and increased use of vegetable fat. The consumption of vegetable fats containing unsaturated aliphatic acids which are extremely essential for the human organism has now reached 8.4 kg per capita per year with a standard of 9 kg. It is assumed that the production of vegetable oil on a per capita base will rise by 1.4-fold by 1990. The planned amounts will make it possible to satisfy the demand of the national economy for vegetable oil.

The Main Crops - Sunflower, Cotton and Soya

In our nation, of the oil crops, the most widespread is sunflower the proportional amount of which in the total production of vegetable oils has reached 65 percent. This crop occupies around 75 percent of the area planted under oil crops and more than 1/2 of the area occupied by this crop in the world. The USSR holds first place in the world for the production of sunflower seed. Due to the work of the Soviet plant breeders, sunflower varieties have been obtained with an oil content of more than 1/2 of the seed weight (41-55 per cent) while the amount of hull has been cut in half (19-23 percent).

Considering the importance of sunflower as the leading oil crop, the "Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period up to 1990" have set an increase in its seed production in the basic regions (the RSFSR, the Ukraine and Moldavia) by 1.2-1.3-fold. Over the long run there are plans to stabilize the area planted under sunflower and the entire increase in the gross harvest will be obtained by raising the yield by 1.5 fold. The increase in the production of oil crops will be aided by new, highly productive disease and pest-resistant sunflower varieties. They exceed the regionized varieties in yield by 10-20 percent and provide improved vegetable oil quality. Sunflower hybrids have been developed with an oil that is improved in terms of the aliphatic acid composition and is close to olive oil, as well as low-growing, high-producing immune hybrids for irrigated conditions.

In producing cottonseed oil, the oil and fat enterprises obtain cottonseed from the cotton gins. Here the disproportions in the placement of cottonseed production and the capacity for processing it have not been completely eliminated and because of this irrational cotton seed shipments arise. In comparison with the transporting of finished product, these shipments cost 40-50 percent more. Turkmenia produces 14 percent of the Union volume of cottonseed but refines only 8 percent. Capacity is also lacking in Uzbekistan.

Soya is an extremely valuable crop which is universal in terms of nutrient composition. It contains balanced protein substances (37-50 percent), food vegetable oil (18-20 percent), lecithin, sugar, vitamins and enzymes. The most valuable component is the proteins. They possess high biological value and to a significant degree can replace animal proteins. The incorporation of soya proteins into recipes for pastry and candy makes it possible to reduce the amount of carbohydrates by an average of 6-7 percent and increase the protein content in the products to 10 percent. The enriching of candy and pastry with soya protein increases their biological value and increases the storage life of the products. The replacing of 15 percent of the dried meat with a protein enricher made from soya in producing canned dishes increases the protein content by 11 percent and significantly reduces product costs.

In terms of basic aliphatic acid composition, soya oil is virtually no different from sunflower. It is used both for food as well as industrial purposes. As yet the soya harvests are low. There are plans to bring them up to 15-20 quintals per hectare by improving the farming methods and introducing new varieties. Soya production will be developed (basically on irrigated lands) in the European USSR as well as the republics of Transcaucasus, Central Asia, and Kazakhstan. Over the long run the planted area is to be broadened and the soya yield increased by 3-4-fold.

Technical Progress in the Oil and Fat Subcomplex

Substantial changes will occur in the methods of producing oil crops. An effective system for the minimum working of the soil before planting and in the growing season will be introduced and the system of fertilizing in the crop rotations will be improved considering the use of the new highly concentrated fertilizers; the methods of their application will also be improved. There are plans to develop the methods for growing sunflower, soya and clover under irrigated conditions using full mechanization, highly productive immune varieties and the broad use of chemicals. As a result of the increased technical level, labor expenditures for producing a ton of sunflower over the long run will almost be cut in half.

In oil production we plan a full conversion to the extraction production method and to providing highly productive equipment. At present the oil producing industry uses extraction lines with a productivity of 360-420 tons of seed processing a day. Over the long run we intend to use lines with a productivity of 1,000-2,000 tons. The methods of processing cottonseed require a substantial improvement. Over the next few years there are plans to convert to the direct extraction of seed by the watering method and the individual processing of the fourth grade and non-standard seed. This will significantly improve oil quality from the first-grade seed used in the production of margarine, salad oil and palmitin. The feed merits of the oil seed meal will be improved by a better protein composition and this will provide an opportunity to use the first-grade cottonseed to produce high-quality seedcake for producing meal and food proteins.

On the Value of Side Products

In processing oil raw materials using modern methods, not only vegetable oils are produced but also seedcake, meal, phosphatide concentrates, vitamins (tocopherols), protein products and so forth. The oil and fat industry each year processes around 10 million tons of oil raw products and produces 3 million tons of vegetable oil as well as up to 4.5-5 million tons of meal and seedcake. The latter are a highly concentrated protein feed for animals, poultry and fish. The sunflower seed proteins are used to enrich combined feeds. Approximately 5-10 percent of the oil seed meal is incorporated in combined feeds depending upon their purpose.

The presence of many irreplaceable, well-balanced amino acids in the oil crop proteins provides reason to feel that soon they will serve as a source for obtaining not only feed but also food protein products. The use of proteins in food meat products as functional additives makes it possible to substantially save on meat resources as well as convert to the development of analogues of certain natural food products using these proteins. The use of proteins in the production of boiled sausages makes it possible to replace five percent of the meat. In the candy industry, new types of raw products will be widely used including: proteins, soya and sunflower flour, surface-active substances the use of which, in addition to improving the quality, makes it possible to save scores of millions of eggs. There are also plans to use sunflower protein for increasing the biological value of bakery goods.

Production and Consumption of Margarine

Over the long run, out of the total quantity of oil used for food purposes, around 50 percent will be consumed in the form of margarine products. For margarine production the USSR employs hydrogenated vegetable oils (sunflower, cotton seed and soya) with the addition of a small quantity of animal fats and solid imported vegetable oils (cocoa and palm-heart). A small amount of butter is used in certain varieties of margarine. Margarine contains 82 percent fat and 18 percent of the water-milk phase. More than 20 types of margarines are included in the group of table varieties used in preparing food under household conditions and at public dining enterprises and sandwich shops. The creation of high-grade table fat based on vegetable oils and other natural fats increases their assimilability and caloric value.

In recent years margarine consumption has risen significantly in our nation. While in 1965, it was 2.7 kg per capita, in 1980, the figure was 5.1 kg. Margarine consumption has increased particularly rapidly in public dining and industry. However, in comparison with a number of foreign nations, its consumption is still much lower. The United States produces ten varieties of margarine and similar paste-like products using soya, cotton seed, corn, sunflower and palm oils. Solid margarine comprises 70.2 percent of the total sales volume on the U.S. market and comes in 4 types. One of these is a product whipped from partially hydrogenated cottonseed and soya oil with the addition of nitrogen. It has a soft consistency and is easily spread on bread even when refrigerated. The soft margarine with a high content of polyunsaturated aliphatic acids comprises 21.6 percent of the total margarine sales in the United States.

In the production of margarine products the USSR has proposed further intensification of production, the broadening of the assortment and the improvement of product quality, including an increase in the output of sandwich margarines for direct use as food. There are plans to develop production of liquid margarines with polymer packaging, dietetic, low-calorie and other new product types. For the bakery, candy and food concentrate sectors liquid margarines have been developed to be delivered in containers and tank trucks. This will provide a significant economic effect by improving the quality, saving boxes and barrels, increasing labor productivity and reducing transport outlays.

In the 11th Five-Year Plan we will continue to install lines with supercoolers having a productivity of 5 tons of product per hour while the automatic packaging equipment will provide a nominal productivity of 200-210 packets a minute and this is double the level of the existing.

Among the products of the margarine industry, mayonnaise is widely popular with the population. For satisfying consumer demand, we will begin producing mayonnaise with a high protein content and a lower level of fats; in addition there will be a dietetic mayonnaise with taste additives as well as flavored mayonnaises.

No Progress Without New Packaging and Equipment

Extensive industrial packaging of foodstuffs is possible only in using polymer and polymer-based combined materials as packaging. Traditional packaging materials (wood, paper, cardboard and glass) not only impede the industrial packaging of the products due to their scarcity and labor intensiveness, but also do not have sufficient protective properties for insuring the safekeeping of the products. Moreover, research has established that the microorganisms, in falling into packaging material (cardboard or paper) in its manufacturing, storage, transporting and use, contribute to the rapid spoilage of a packaged product.

The development of the production of polymer materials creates conditions so that the manufacturing of the products and the packaging process follow one another in observing optimum hygiene principles. While previously the purpose of the packaging was to make the commodity transportable and to protect it against external effects, now, in selecting the corresponding compositions of polymer and other materials, the packaging is given properties which keep the taste and biological value in the product and protect it against oxidation, microbiological and other spoilage and loss. In world practice this type of food product packaging is becoming evermore widespread. Hundreds of types of polymer and combined materials are used for manufacturing consumer packaging and transport crating.

The oil and fat industry began to employ polymer packaging in 1968 for the packaging of liquid and paste detergents. Since 1973, a small amount of vegetable oil has been packaged in bottles containing 0.5 liter and made from polyvinyl chloride film. Mayonnaise and margarine are also packaged in polymer containers. In packaging vegetable oil in a disposable polymer container which is 20 times lighter than glass, the savings is 190 rubles per ton of product.

The successful solution to the problems involved in further increasing the efficiency and quality of work in the oil and fat industry largely depends upon the availablity of modern highly productive equipment. For example, an insufficient amount of deodorizers impedes increased output of superior quality edible oil. These units are also essential in producing margarine products and mayonnaise. Each year the demand for deodorizers is satisfied by not more than ten percent.

An improvement in the production methods of margarine products is impeded by the fact that the technical level of the Soviet-produced equipment is inferior to the foreign. Soviet industry does not produce lines for low-concentrated liquid margarines with packaging in polymer containers or lines for packaging vegetable oils in these containers.

The operation of the enterprises in the oil and fat subcomplex is directly dependent upon the quality of the raw materials and their efficient use, upon an improvement in the existing types of equipment and the development of new ones as well as upon the availability of the required amount of new packaging materials.

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WAYS FOR IMPROVING GRAIN PRODUCTION, SUPPLY EXAMINED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 48-57

[Article by V. D. Kolobayev, USSR deputy minister of procurement and Candidate of Agricultural Sciences K.S. Oleshko, sector head at the Central Economics Scientific Research Institute Under the RSFSR Gosplan, Moscow: "The Grain Product Subcomplex: Directions for Improvement"]

[Text] In the Food Program one of the main places is held by the grain product subcomplex (GPC). Its aim is to fully satisfy all the national economic requirements for high-grade grain products for food and feed uses, to create emergency carryover supplies and state reserves guaranteeing the uninterrupted supply of the population with grain products regardless of fluctuations in the yield and seasonal nature of production as well as to develop exports. The subcomplex encompasses the production of cereals in agriculture, state grain purchases, its processing in the industrial sectors and the corresponding infrastructure such as transport, the elevator and warehouse system (with the station-side warehouses, the grain dryers and other equipment which protect the grain), crating, packaging materials and so forth.

The development of the GPC is envisaged on the basis of efficient production and the economically rational use of grain raw materials and products along the entire path from the field to the consumer (see the diagram).

The production of grain on the nation's kolkhozes and sovkhozes is the central element around which all the subdivisions of the subcomplex are formed. During the Tenth Five-Year Plan the average annual gross grain harvest was 205 million tons and the maximum was obtained in 1978 with 237.4 million tons. Calculated per person, this corresponds to: 785 kg over the Tenth Five-Year Plan and 908 kg for 1978. The 26th CPSU Congress has planned to bring the gross grain harvest in the 11th Five-Year Plan up to 238-243 million tons. According to the known calculations by specialists, it is essential to produce up to one ton of grain per person per year. The achieving of this level is envisaged in agriculture by resorting to intensive factors such as: the increased yield, improving the structure of the grain wedge, increasing the level of mechanization, introducing progressive flow methods for growing considering the zonal features and scientifically based growing systems as well as by reducing losses. It has been estimated that the implementing of the planned measures with their comprehensive introduction will make it possible to save the national economy around 40-45 million tons of grain and this in world market prices corresponds to an income of 4-5 billion dollars.

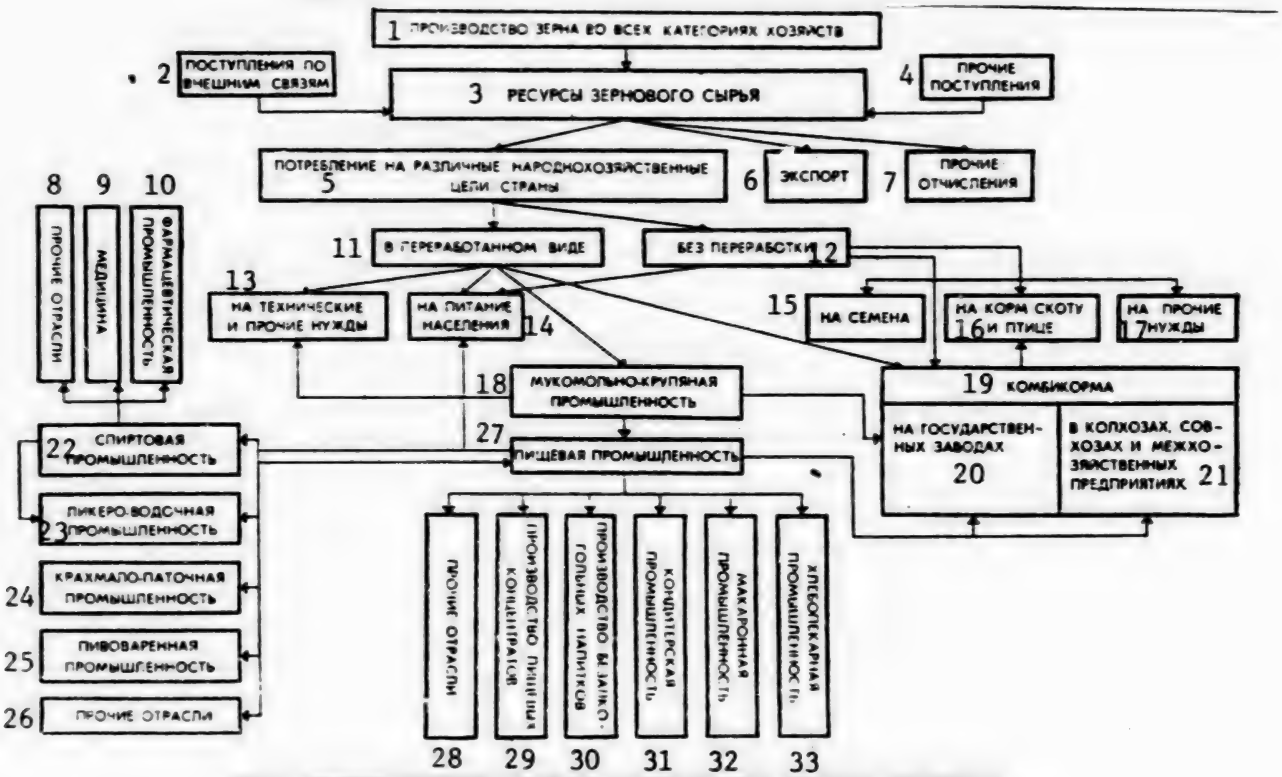
1 ПРОИЗВОДСТВО ЗЕРНА ВО ВСЕХ КАТЕГОРИЯХ ХОЗЯЙСТВ
2 ПОСТУПЛЕНИЯ ПО ВНЕШНИМ СВЯЗЯМ
3 РЕСУРСЫ ЗЕРНОВОГО СЫРЬЯ
4 ПРОЧИЕ ПОСТУПЛЕНИЯ
5 ПОТРЕБЛЕНИЕ НА РАЗЛИЧНЫЕ НАРОДНОХОЗЯЙСТВЕННЫЕ ЦЕЛИ СТРАНЫ
6 ЭКСПОРТ
7 ПРОЧИЕ ОТЧИСЛЕНИЯ
8 ПРОЧИЕ ОТРАСЛИ
9 МЕДИЦИНА
10 ФАРМАЦЕВТИЧЕСКАЯ ПРОМЫШЛЕННОСТЬ
11 В ПЕРЕРАБОТАННОМ ВИДЕ
12 БЕЗ ПЕРЕРАБОТКИ
13 НА ТЕХНИЧЕСКИЕ И ПРОЧИЕ НУЖДЫ
14 НА ПИТАНИЕ НАСЕЛЕНИЯ
15 НА СЕМЕНА
16 НА КОРМ СКОТУ И ПТИЦЕ
17 НА ПРОЧИЕ НУЖДЫ
18 МУКОМОЛЬНО-КРУПЯНАЯ ПРОМЫШЛЕННОСТЬ
19 КОМБИКОРМА
20 НА ГОСУДАРСТВЕННЫХ ЗАВОДАХ
21 В КОЛХОЗАХ, СОВХОЗАХ И МЕЖХОЗЯЙСТВЕННЫХ ПРЕДПРИЯТИЯХ
22 СПИРТОВАЯ ПРОМЫШЛЕННОСТЬ
23 ЛИКЕРО-ВОДОЧНАЯ ПРОМЫШЛЕННОСТЬ
24 КРАХМАЛО-ПАТОЧНАЯ ПРОМЫШЛЕННОСТЬ
25 ПИВОВАРЕННАЯ ПРОМЫШЛЕННОСТЬ
26 ПРОЧИЕ ОТРАСЛИ
27 ПИЩЕВАЯ ПРОМЫШЛЕННОСТЬ
28 ПРОЧИЕ ОТРАСЛИ
29 ПРОИЗВОДСТВО ПИЩЕВЫХ КОНЦЕНТРАТОВ
30 ПРОИЗВОДСТВО БЕЗАЛКОГОЛЬНЫХ НАПИТКОВ
31 КОНДИТЕРСКАЯ ПРОМЫШЛЕННОСТЬ
32 МАКАРОННАЯ ПРОМЫШЛЕННОСТЬ
33 ХЛЕБОПЕКАРНАЯ ПРОМЫШЛЕННОСТЬ

СХЕМА ПРОИЗВОДСТВЕННЫХ СВЯЗЕЙ ПО ИСПОЛЬЗОВАНИЮ ЗЕРНОВОЙ ПРОДУКЦИИ.

Diagram for Production Ties in use of Grain Products

Key:
1-Grain production on all categories of farms;
2-Deliveries under foreign ties;
3-Resources of grain raw materials;
4-Other delivery;
5-Consumption for various national economic goals of the country;
6-Exports;
7-Other deductions;
8-Other sectors;
9-Medicine;
10-Pharmaceutical industry;
11-In a processed form;
12-Without processing;
13-For technical and other needs;
14-For feeding the population;
15-For seed;
16-For feed to livestock and poultry
17-For other needs;
18-Flour-milling and groat industry
19-Combined feeds;
20-At state plants;
21-Kol-, sovkhozes & interfarm plants
22-Alcohol industry;
23-Liquor and vodka industry
24-Starch and molasses industry
25-Beer brewing industry;
26-Other sectors;
27-Food industry;
28-Other sectors;
29-Production of food concentrates
30-Production of non-alcoholic beverages;
31-Candy industry
32-Macaroni industry
33-Bakery industry.

What Should Be the Optimum Pace and Proportions in the GPC?

The structure of the national economic demand for grain products is the basis for establishing optimum proportions between the GPC sectors and the development rate of each of the subdivisions which comprise the single product chain of the entire subcomplex. The individual needs of the national economy for grain resources and, correspondingly, for grain products are still not uniformly satisfied. Thus, the demand for food and seed grain and for producing the "non-bread" products (alcohol, beer and starch) are basically satisfied. Each year around 300 kg of cereals per person are consumed for these purposes. Over the long run this indicator will not change substantially since the increase in the population will be accompanied by a decline in the average per capita bread consumption and an enlarging of the planted area is not envisaged.

In the subdivisions of the GPC concerned with the production of food and seed grain all changes should be aimed chiefly at improving the quality indicators, that is, increasing the content of biologically active, nutritionally useful substances in the products and improving seed standards. The tasks are to be carried out by increasing the productions and purchases of the durum and strong wheat varieties with an increased gluten content and high vitreousness suitable for manufacturing a broad variety of macaroni and bakery goods; groat crops rich in protein and microelements (rice, buckwheat and pulse crops) as well as brewing barley. In the industrial sectors, these changes will be more substantially reflected, particularly in the locating of the GPC subdivisions over the territory of the nation on the basis of bringing productions closer to the consumer.

The demand has not been satisfied for grain resources to be used as livestock and poultry feed. Over the long run the demand for feed grains will grow but at a declining rate as the consumption of livestock products comes closer to the rational standards. The production of one ton of grain per person outlined for the future, with the stabilizing of the demand for grain for food and seed purposes on the already achieved level will make it possible to allocate up to 600 kg per man out of each ton for livestock and poultry feed.

The end products of the grain consumed by the population are the bakery, macaroni and partially the candy and other articles produced by the corresponding sectors of the food industry. In addition, through the market stocks and public dining the population receives flour and groats from the flour-milling and groat enterprises. The combined feed industry holds a special place among the sectors and its products are returned to agriculture as means of production.

The new, more complicated tasks which must be carried out in the development of agriculture during the 1980's in turn place new increased demands upon the development of the sectors which receive and process agricultural products. The task is, along with increasing grain production, to develop technically and technologically the grain product subcomplex which would be capable of eliminating the grain losses in the process of transporting, receiving, processing and storage and producing from this products of the necessary assortment and high quality, having thereby achieved highly efficient use of the agricultural products in the national economy. The solution to this problem lies primarily in the development of the elevator industry.

A Home for Grain

The elevator industry is an important componenet in the national economic infrastructure. On an industrial basis it provides for the receiving of grain from the kolkhozes and sovkhozes, its post-harvest processing, the creation of market lots, the storage and dispatching of grain for processing by the flour-milling, groat and combined feed plants as well as for the food industry enterprises.

The existing network of grain-receiving enterprises numbers over 5,000 units which are specialized in the receiving, processing and storing of the appropriate types of grain. Varietal seed is received by around 100 enterprises equipped with seed cleaning equipment while hybrid corn seed is processed at 212 corn-processing plants. The grain storage facilities are equipped with forced-air ventilation and powerful grain dryers.

During the 11th Five-Year Plan elevator capacity will be built and put into operation for 20 million tons and approximately 1.3 billion rubles of capital investments have been allocated for this. The All-Union Scientific Research Institute for Grain and Grain Processing Products and the design institutes of the USSR Ministry of Procurement are confronted with the task of working out the questions involved in the long-range development and location of grain storage facilities on the nation's territory. This will help in determining the rational ways for increasing their capacity.

The construction of elevators in the 11th Five-Year Plan is to be done chiefly from site-cast and prefabricated reinforced concrete with structural reinforcing of the vertical and horizontal seams as well as in the form of metal silos. There are plans to increase the capacity of the grain dryers and cleaners, to mechanize the loading and unloading work, including for crated freight and loose materials and the building of shops to process the hybrid and varietal seed.

To Consume Grain Economically

In the GPC the flour-milling and groat industry is the intermediate link between the state grain purchases and the sectors producing the end products.

Here over the long run the task will be to reconstruct and technically re-equip the existing mills and introduce at them rational production processes and technical solutions using highly efficient equipment. The carrying out of this task involves the building of mills with a capacity of 500 and 250 tons of grain processing per day similar to the Ramenskiy milling combine. Development and testing have been completed on highly productive equipment of more than 100 types. In the next few years there are plans to build 50 enterprises equipped with such facilities. This will make it possible to double the delivery of high-grade flour to the bakeries and confectionery enterprises for improving the assortment of bakery and confectionery products.

Broadening the assortment of flour is necessitated by the need to improve the quality of bakery goods on the basis of the rational use of the grain's protein resources. Over the long run, along with producing flour for the mass bakery goods, there are plans to produce flour with a varying gluten content for products like "palyanits", Saratov bread, soft rolls and so forth. The production of different purpose flour with a differentiated protein content will provide a significant saving of grain protein resources in stabilizing its quantity. Over the long run flour output with a reduced gluten content will be approximately one million tons, including 700,000 tons of high-grade flour and 300,000 tons of first-grade flour. New production methods will be employed for this.

There are plans to turn out new types of products for use in the food, medical, perfume and combined feed industries as biostimulants.

The main task of the flour milling industry will be to further improve the technology for grain processing based on a study of its properties. Thus it is essential to increase the efficiency of cleaning impurities from the grain in preparing it for milling. For this we must develop new machines and progressive production procedures using fractional separation. In addition, it is essential to work out more advanced equipment and methods for the hydrothermal processing of grain.

An increase in the overall output of flour with a simultaneous improvement in its quality based upon multistage milling and separation causes a significant lengthening of the flour milling process and the further saturating of the enterprises with complicated equipment. On the basis of the rational and highly efficient use of grain resources in the 11th Five-Year Plan, in comparison with the Tenth, there are plans to increase the production of superior quality flour by 24-27 percent, with an increase in the production of all graded flour by 7.8 percent. Here the proportional amount of superior quality flour in the total production volume should rise to 21 percent in 1985 and in 1990, to 30 percent, instead of the present 16.4 percent. The growth rate for all flour production in the 11th Five-Year Plan calculated on a per capita basis will remain on the level of the 10th Five-Year Plan.

More Groats-Good and Diverse

In terms of importance and quantity, groats are the second grain processing product after flour. Due to their high caloric value, assimilability and good culinary properties, they are widely used in public dining, the food concentrate and canning industries. Our nation produces all the grain crops from which domestic industry produces groats. The range of groat products numbers more than 33 items. The most valuable for human nutrition are the buckwheat, rice and pea groats as well as the oat flakes "Gerkules."

In recent years the All-Union Scientific Research Institute for Grain and Its Processing Products has developed new types of groats. Thus, together with the Nutrition Institute of the USSR Academy of Medical Sciences, groats have been developed with increased nutritional value from crushed rice, split peas, cracked grain and other types of raw materials which are not in great demand. The new groats contain a high percentage of protein, irreplaceable amino acids, vitamins and minerals. A method has been developed for producing quickly cooked groats from barley, wheat and peas and their production will start in 1982. The cooking time for the quick-cooked pearl groats, the wheat groat of the "Poltavskaya" type and peas is threefold less than the ordinary range of groats. In the 1980's we will develop a new method for producing rice and millet using advanced equipment.

As Is the Grain, So Are the Rolls

Definite demands are made on the quality of food grain and these stem from the flour milling and baking properties. Among them are: the volume weight of the grain (the weight of 1,000 grains), vitreousness, gluten content and so forth. For the gradual-reduction wheat, the volume weight should be at least 750 gm, vitreousness 40-60 percent and the gluten content 25 percent. From such grain there is a maximum output of superior and first-quality flour (up to 75-78 percent), while the bread baked from it possesses good volume, a light, elastic inside and a tasty brown crust.

However, the quality of grain being received by the state granaries does not always meet the established standards. Although the grain volume weight as an average for the nation was 751 gm in 1976-1980, it varied over the years of the Five-Year Plan.

The gluten content in the purchased grain as an average for 1976-1980 was 23.4 percent with a standard of 25 percent. For this reason for obtaining the standard varietal flour we had to add grain of improver wheats. The strong wheats, in being mixed in a certain proportion with the nonstandard flour from weak wheats, increase the technological and particularly the baking properties of the latter. Wheats of the so-called valuable varieties do not possess this property and merely ensure the obtaining of standard flour. The state is interested in obtaining valuable wheats and is encouraging their sale by a ten-percent surcharge on the price, but these wheats do not replace the strong ones. The purchasing of grain from the strong and durum wheats is encouraged by a higher surcharge (up to 30-50 percent) on the basic price. However, their production still does not satisfy the nations's needs.

Particularly high is the demand for durum class wheat suitable for producing macaroni flour (long-tube macaroni can only be made from flour produced from durum wheat of the 1st and 2d classes). The durum wheats from Orenburgskaya, Saratovskaya, Kustanayskaya, Kokchetavskaya, Tselinogradskaya and a number of other oblasts are not inferior in quality to the best Canadian amber durum wheat which is a unique standard on the world grain market. The favorable conditions for growing the high-quality durum wheats in our nation are far from fully utilized. Their production is concentrated basically in Kazakhstan, to a lesser degree in the RSFSR and very insignificantly Ukraine. Due to poor quality, food grain is often used for feed purposes while in improving the quality indicators it could serve as a valuable raw material in baking or be a source of exports. For this reason it is essential to aid in every possible way in increasing the share of the strong and durum wheats in the total volumes of grain procurement.

Among the functions of the GPC one must also put the development of external ties oriented predominantly on wheat exports. Winter wheat is not only productive in terms of the grain bulk but also provides the highest (afterpulse crops) protein yield per hectare of planting. Calculations have established that due to the shortage of feed grain for feed purposes around 20 million tons of food grain are employed, including wheat and this wheat is sold at higher prices on the world market. Obviously an increase in the imports of feed grain by expanding the exports of wheat would be advantageous economically for our nation both in the immediate and more distant future.

According to approximate calculations, proportionality and rhythmicalness in the operation of all the elements (field-combine-threshing floor-elevator-processing industry-consumer) could increase the output of end products by 20-25 percent by 1985 (with an increase in the raw material resources of 16-18 percent), in 1990 by 1.7-1.8-fold (with an increase in the raw material resources of 1.4-1.5-fold) without increasing the number of workers. By reducing the number of workers in the agricultural sector, the number of workers can be increased in industry, mainly in the combined feed sector. A rise in labor productivity should be aided primarily by a greater capital-to-labor ratio for all the subdivisions of the GPC based upon the achievements of scientific and technical progress.

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AGRO-ECONOMICS AND ORGANIZATION

IMPROVEMENTS IN STRUCTURE, MANAGEMENT OF SUGAR INDUSTRY VOICED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 58-67

[Article by Candidate of Geographic Sciences N. S. Kuftyreva, senior science associate of the Central Economics Scientific Research Institute under the RSFSR Gosplan, Moscow: "Particular Features of the Sugar Beet Subcomplex"]

[Text] In its present state the sugar beet agroindustrial subcomplex represents a mechanical unification of two separately managed sectors (beet-growing and the sugar industry) through a system of commodity-monetary contracts. This impedes the eliminating of the imbalance and territorial disproportions between them. The task of increasing the efficiency of beet sugar production in the commenced decade raises a number of urgent problems. These are:

1) Optimizing the placement of the beet growing and sugar refineries;

2) The complete balancing of the raw material and processing subsectors with the production and social infrastructure;

3) A sharp decline in sugar beet and sugar losses in agriculture, in transporting and in industry;

4) Improving the planning and management of the subcomplex.

A solution to the posed problems is possible only in working out and constantly implementing a specific program for the entire production agroindustrial complex [APK] (see figure 1).

The Problem of Rational Placement

Improving the territorial placement of beet sugar production is a problem of long-range planning. The question involves not only the development of new beet raising areas and the completion of new sugar industry capacity but also the decision to close down the mills located in areas unfavorable for beet raising. It is important to formulate the territorial structure of sugar beet production both for the nation as a whole and for the individual regions precisely now in order to avoid the dissipating of capital investments, to check the development of the sugar industry in areas with low beet productivity and poor product quality which significantly increase the cost of the end product and to create favorable economic prerequisites for the development of the better beet-raising areas.

[Key for Figure 1. on following page:

1--End goal: meeting population's need for sugar with increased production efficiency;
2--Improving planning and management of sugar beet production;
3--Accelerating scientific and technical progress;
4--Adjusting territorial proportions;
5--Social adjustments;
6--Providing labor resources;
7--Working out a system of proportional indicators aimed at end production products;
8--Introduction of electronic computers and mathematical economics methods;
9--Disclosing patterns in the fluctuation of productivity and quality of sugar beet raw materials;
10--Determining favorability of areas for development of sugar beet production;
11--Development of social infrastructure;
12--Elaboration of new technologies;
13--Elaboration of procedural methods for forecasting fluctuations;
14--Elaboration of procedural methods for determining priority areas for capital investments to increase production capacities;
15--Transportation and communication;
16--Service and cultural construction;
17--Breeding and processing of beet seed;
18--Material-technical supply;
19--Creation of a flexible planning system considering regular fluctuations in natural situation;
20--Calculating production volumes over long run for years with varying natural situation by regions and in the republic as a whole;
21--Elaboration of measures to eliminate negative features of seasonal production.
22--Balancing of total technological process;
23--Differentiation in amounts of sugar output for years (for the RSFSR and its beet-raising areas);
24--Development of production infrastructure;
25--Creation of reserve stocks;
26--Determining change in amounts of controllable production factors for levelling out negative effects of natural fluctuations;
27--Variation in beet-growing techniques;
28--Maneuvering of planted areas;
29--Maneuvering of production volumes in areas;
30--Maneuvering of labor resources in agroindustrial complex.]

The sugar beet agroindustrial subcomplex operates on a biological raw material which is little transportable and has rigid limitations in terms of storage times prior to processing. The influence of the natural situation is strongly reflected on it. The delivery of raw materials over the years and the sugar content in them show a significant fluctuation: for the USSR the fluctuations reach 28-51 percent, for the Ukraine 26-56 percent and for the RSFSR 43-59 percent.

An analysis of the indicators for the productiveness and quality of beet raw materials and sugar yields in the sugar industry disclose cyclical fluctuations in the production activities of the sugar beet subcomplex. Graphs have been constructed for

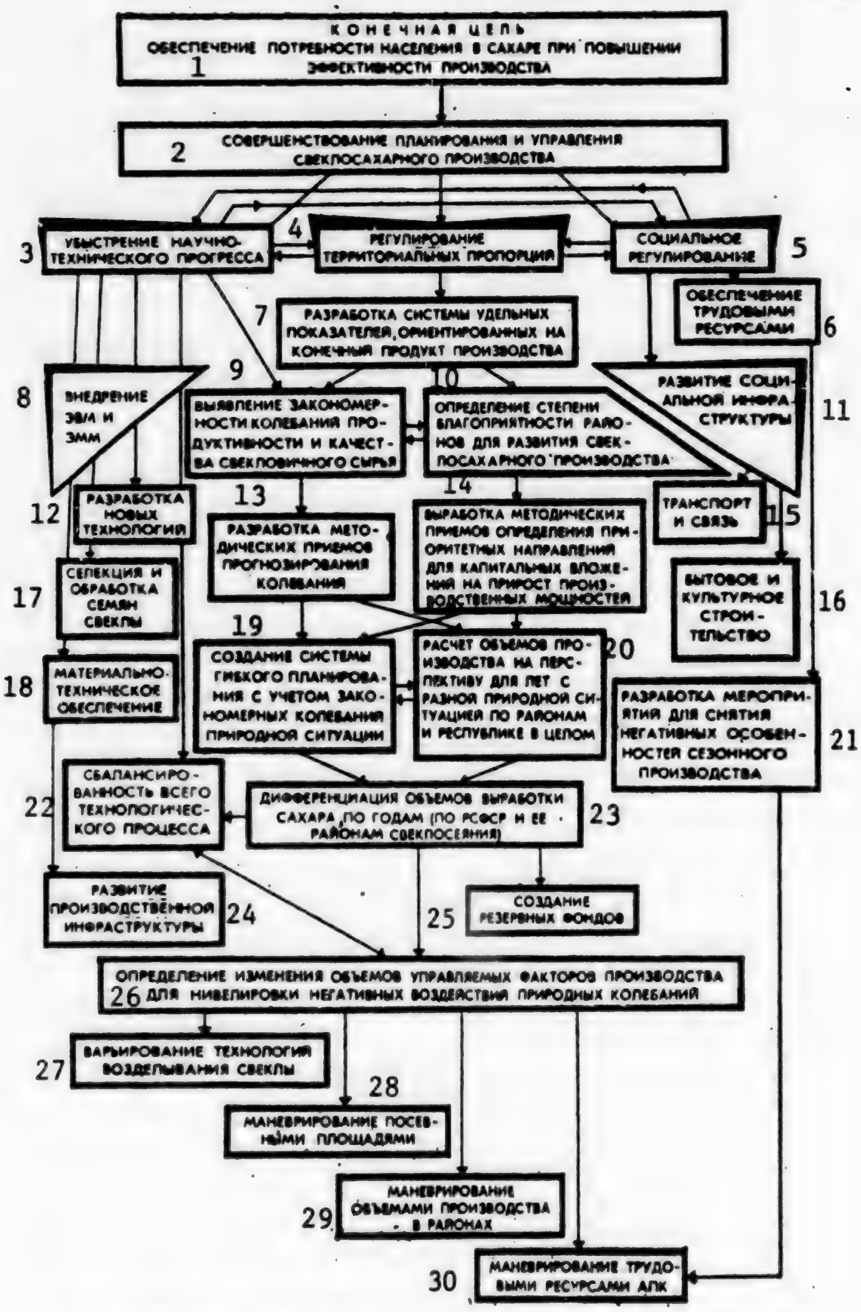
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РИС. 1. ДЕРЕВО ЦЕЛЕЙ ПЛАНИРОВАНИЯ И УПРАВЛЕНИЯ СВЕКЛОСАХАРНЫМ ПРОИЗВОДСТВОМ.

Figure 1. Tree of Goals for the Planning and Management of Sugar Beet Production.

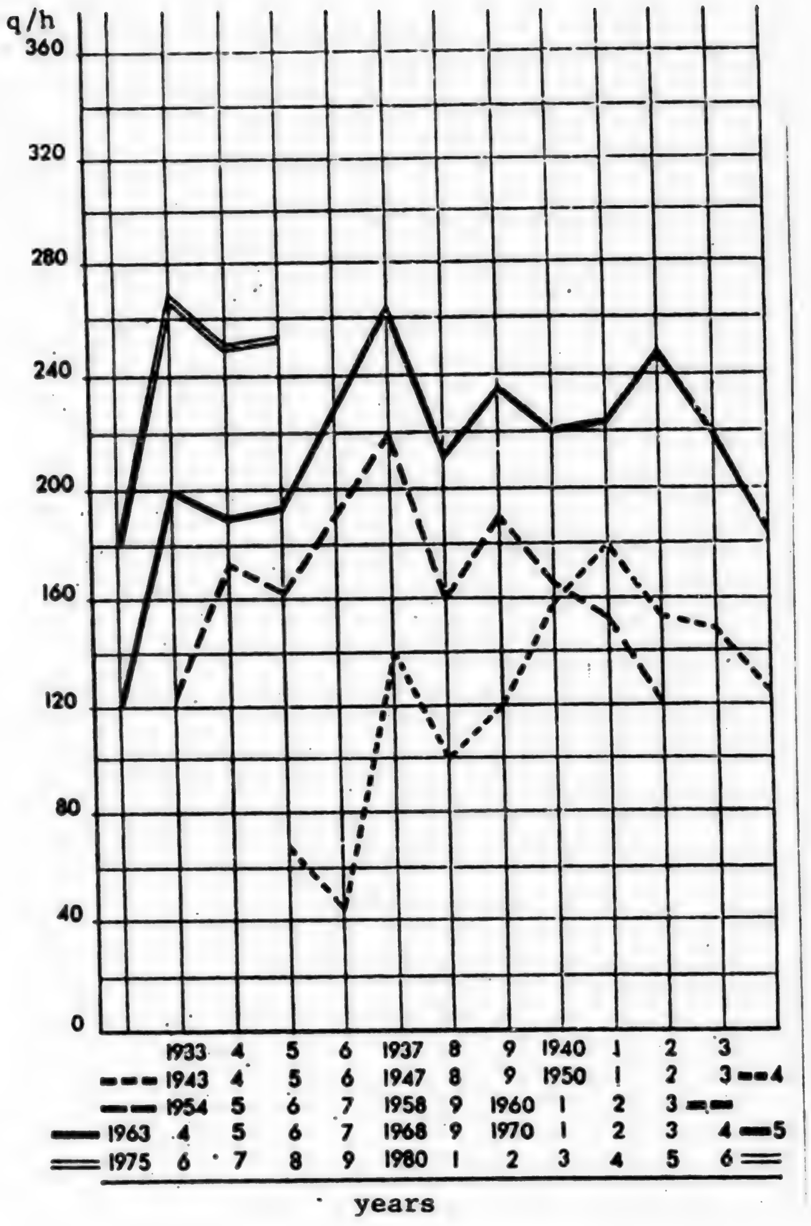

Figure 2. Fluctuations in Sugar Beet Yield Within Cycles of Solar Activity in the USSR.

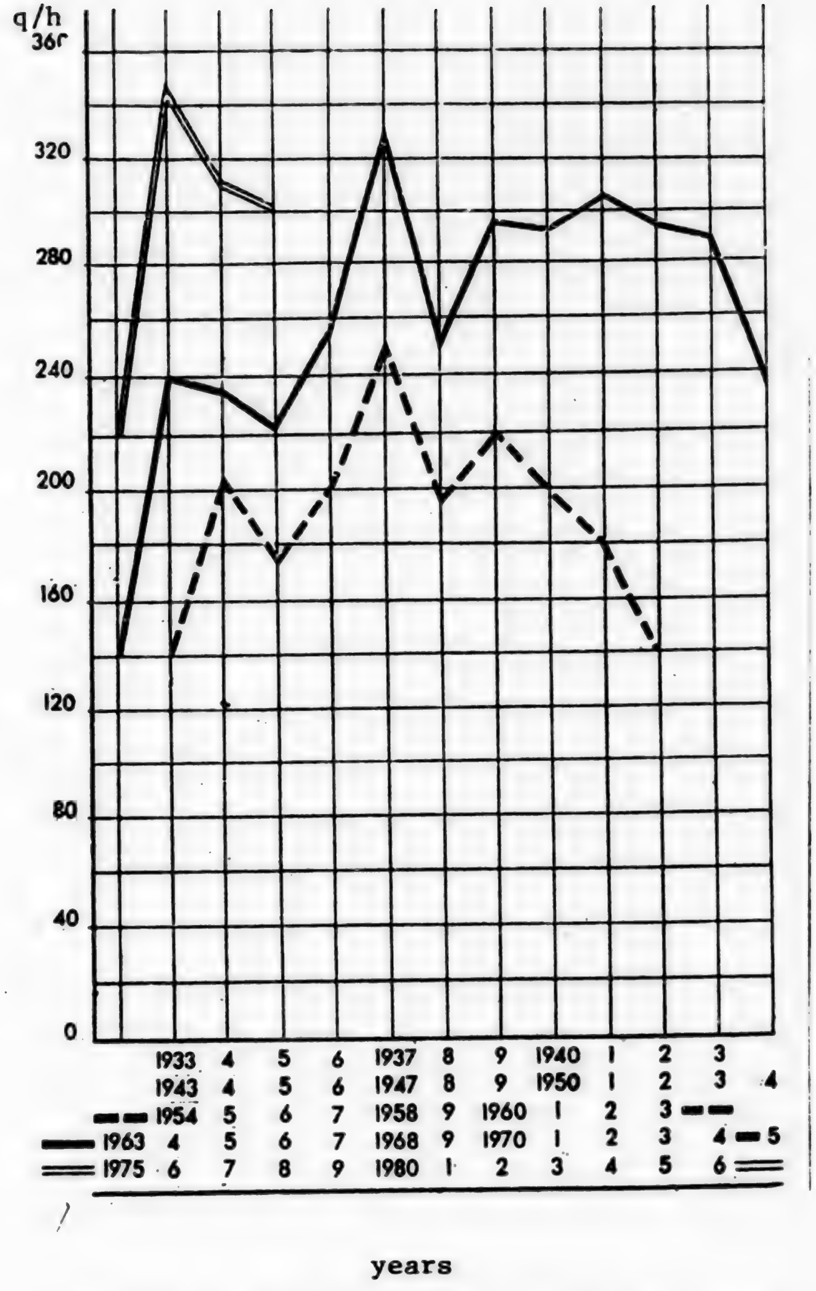

Figure 3. Fluctuations in Sugar Beet Yield Within Cycles of Solar Activity in the Ukraine.

correlating these indicators over time for a number of complete cycles of solar activity with the adducing of data from fundamental natural sciences on the impact of solar and geomagnetic activity on changing the course of processes in the earth's biosphere. The correlating of the cycle graphs using the "imposition of eras" method under the condition of lining up the years with maximum crop productivity along the vertical disclosed a regular fluctuation in the beet yield indicator (see figures 2 and 3). On the basis of this work rather strict procedures were developed on the basis of which calculations have been made and all the basic beet-growing regions of the nation assessed. As a result of the evaluation made, all the beet-producing territories have been divided into three groups: with favorable, less favorable and unfavorable conditions for the further development of sugar beet production.

For the first group it has been recommended that the production scale be broadened; for the second there should be stabilization. In the third group characterized by low ground productiveness and poor quality raw materials as well as high expenditures for raising the beets and producing sugar, after 1985 it is advisable to reduce or halt production.

Thus, the calculations for sugar beet production in the RSFSR have shown that with the concentrated channeling of capital investments to increase sugar industry capacity in the best beet-raising area, the Central Chernozem Zone, the proportional amount of it in the output of beet sugar in the RSFSR will increase to 72-75 percent. In satisfying the demand for comprehensive equipment, the effect from reducing expenditures during high-yield years can reach 163 million rubles in agriculture and 37.8 million rubles in the sugar industry. Moreover, the new placement creates an opportunity to save labor expenditures of around 220,000 men in the raw materials system and 15,000 men in industry for the RSFSR. The new placement and concentration of investments in the selected area will substantially reduce the costs of beet sugar.

The most favorable zones for the priority development of sugar beet production during the 11th Five-Year Plan: Vinnitskaya, Kiyevskaya, Cherkasskaya and Khmel'nitskaya oblasts in the Ukraine and Belgorodskaya, Voronezhskaya and Kurskaya oblasts in the RSFSR. If the new capacity in these oblasts begins operating at the end of the 11th Five-Year Plan, it will be producing fully only in the 12th Five-Year Plan. According to estimates, by 1990 the four oblasts of the Ukraine will be able to produce up to 40 percent of the total amount of sugar and the three oblasts of the RSFSR will provide 21 percent. As a whole for the Ukraine and the RSFSR, including the remaining beet-raising areas, aside from the ones where this has been eliminated, sugar output will be such a high share of its national production that there will be a significant reduction in expenditures and a rise in labor productivity calculated per ton of end product as well as in the total figures.

This path of adjusting the territorial proportions with a rise in production intensification and concentration does not require additional investments above those already planned for the Ukraine and the RSFSR for the development of all the subdivisions.

Balancing of Production

The basic sources for increasing sugar output lie in the sphere of the correct, scientifically based organization and methods of production, in the precise balancing of all its elements as well as complete material and technical supply for all operations involved in the growing, harvesting, transporting and processing of the sugar beet raw materials.

In recent years, regardless of the increased expenditures by the state to insure the functioning of the sugar beet subcomplex, its national economic efficiency has been below the planned because of a significant increase in losses. According to the materials of Glavsakharprom [Main Administration for the Sugar Industry], the losses from the biological crop are 18-32 percent of the entire grown crop for the Ukraine, 26-44 percent for the RSFSR and 19-34 percent for the USSR as a whole. This means that during years of a large crop in the agriculture sphere the nation loses 45 million tons of beets and poor years up to 16 million tons. For example, the early digging of beets in the zones of refineries which do not have reserve production capacity for processing the entire bulk of the raw materials within the optimum dates reduces the yield by 15-20 quintals per hectare, or 28-40 percent of the loss in the biological crop.

The poor condition of roads in rural localities leads to losses in transporting of up to 5 percent of the gross beet root harvest for the nation.

Particular attention must be paid to the problem of preserving the sugar in the beets. The loss of just 1 percent of the sugar in a harvested beet calculated per year equals the loss of more than 700,000 tons of sugar in the industry, the resources of retail commodity turnover are reduced by approximately 500 million rubles, the cost of beet sugar rises, profits decline and over 170 million rubles of turnover tax are lost.

Sugar yield per ton of sugar beet as an average for the RSFSR over a long period of time (1964-1975) is 0.115 ton. An estimate of sugar losses along the entire production chain indicates that in agriculture and in transporting the beets, up to 55.5 percent of the sugar in the grown beets is lost and 14.5 percent in industry due to organizational factors (the lack of equipment, the extending of the production season and the violating of production conditions). The ways for reducing these losses are to strengthen the contacts between the beet growers and the sugar workers and to strengthen mutual responsibility for preserving the quality of the raw materials in all stages of growing, harvesting, transporting and processing the beets.

The Decree of the CPSU Central Committee and the USSR Council of Ministers of 15 June 1978 "On the Full Mechanization and Introduction of Chemistry into the Growing of Sugar Beets and the Further Development of the Sugar Industry" for the 11th Five-Year Plan outlined a specific program of material-technical supply to provide beet production with loading and transport equipment. By 1986 we plan to complete the delivery to agriculture of a range of equipment for growing the beet crops without manual labor and for harvesting and transporting the raw materials to the mills. The amounts of capital investments have been set for the development of production capacity in the sugar industry. This establishes a solid base for complete balancing of the entire production process. The measures to improve the territorial proportions can significantly strengthen the effect of the balancing.

The long-term program for increasing the proportional amount of the most favorable beet-growing areas in the nation within the beet sugar production structure can be completed in its first stage by the end of the 12th Five-Year Plan. But the decisions on the priority capital investments in these areas must be taken and started in 1981-1985. In the adopted program for completing the full mechanization of beet-growing by 1986, the program for adjusting the territorial proportions can cause changes in the territorial distribution of all types of new equipment. We feel that this is a natural process and that it is aimed at improving the territorial balancing of production.

The preliminary calculations indicate that due to the additional investments into beet-growing equipment and the means for the scientific organization of the beet-growing process and investments into loading equipment and transport, by 1990, it would be possible to reduce the losses of the biological crop by 4-fold and the losses in the gross beet harvest by 6-fold (including the losses from the reduced sugar content). This will provide an economic effect totaling 1.77 billion rubles.

Improving the Planning System.

The creation of a flexible planning system for the entire product complex is an old problem opening up a possibility of manipulating the material resources, the labor force and the methods of growing the raw materials. Particularly urgent is flexibility in the planning system in the sugar beet and fruit-vegetable subcomplexes which possess highly perishable raw materials; these are consumed or processed completely within the annual production cycle. The unstable deliveries of raw materials over the years put the agricultural enterprises and their industrial partners under economically unfavorable conditions. The nation does not receive the needed products. The nonfulfillment of the plan is followed by bank penalties for nonrepayment of loans and restrictions placed on funds in preparing for the new annual reproduction cycle. The economically weak farms suffer most from this.

As was shown above, the processes involved in the change in the bulk amount of raw material over the years and the content of industrially extractable sugar show a definite pattern. This creates an opportunity for more objective planning and more flexible maneuvering of the resources, material means and production procedures during years with a varying natural situation. The unfavorable natural impact and the abruptness in the fluctuations of sugar beet crops can be significantly mitigated.

The 26th CPSU Congress posed a responsible task for the beet growers and sugar industry works. This was to bring the annual sugar beet production in the nation up to 100-103 million tons and increase sugar production by 23-26 percent. This requires not only high organization and the balancing of production in the entire subcomplex but also the abandoning of sluggish thinking in the very system of planning and managing its economic and social processes.

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AGRO-ECONOMICS AND ORGANIZATION

BETTER MANAGEMENT OF FRUIT, VEGETABLE SECTOR PROPOSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 67-77

[Article by Candidate of Economic Sciences A. N. Lifanchikov, sector head of the Central Economics Scientific Research Institute Under the RSFSR Gosplan, Moscow: "The Fruit and Vegetable Subcomplex: Reducing Losses and Increasing Functional Efficiency"]

[Text] The State of Affairs

The fruit and vegetable subcomplex is an aggregate of specialized enterprises in agriculture, industry and trade which produce, process, transport, store and sell fruits, berries, vegetables and potatoes. The end product of the subcomplex is made up of both fresh vegetables, fruits, berries and potatoes as well as canned, salted and fermented, quick-frozen and dried. They meet the population's need for vitamins, minerals, organic acids and carbohydrates.

Over the last 15 years, per capita consumption of vegetables and melon crops has increased by 1.3 fold, for fruits and vegetables by 1.2-fold. By 1980, the area planted under vegetables had increased by 21 percent in comparison with 1965; vegetable production had risen 1.5 fold and reached 26 million tons a year. The vegetable yield has shown a steady trend toward increasing. While as an average in 1961-1965 the yield was 116 quintals per hectare, in 1966-1970 it was 132 quintals per hectare, in 1971-1975, 138 and in 1976-1980, 152 quintals per hectare. Vegetable raising has developed most rapidly in the southern regions of the nation due to the favorable natural-climatic conditions, to the sufficient manpower resources and to the high prices for early vegetables.

Potatoes are a traditional food product in many regions of the USSR. Average potato consumption has declined and in 1980 was 112 kg in comparison with 130 in 1970 and 120 in 1975. However, one cannot agree with the opinion of specialists who view such a decline as a positive phenomenon. As is known, the demand for potatoes in the state trade network in recent years has not been fully satisfied. Potato deliveries to the kolkhoz urban markets have declined, while the starch-molasses, vegetable-drying and alcohol industries have not received a sufficient amount of potatoes. Characteristically, in nations where the potato is a traditional food product (for example in the GDR), its consumption level is higher than in the USSR.

The Reasons for the Lag

A study of the diet and availability of vitamins for various categories of the USSR population, as carried out by the Nutrition Institute of the USSR Academy of Medical Sciences, has shown that the intake by the human organism for a whole series of vitamins (primarily vitamins C, A, B_1, B_2 and PP) is insufficient, particularly in the winter and spring.

There are many reasons for the relatively low consumption of fruit and vegetable products (not counting potatoes). The soil and climatic conditions in many regions of the USSR are little favorable for developing highly productive orchard, vineyard and vegetable raising. For example, the yield of the orchards and berry patches in the RSFSR and Belorussia, in occupying around 38 percent of all the fruit-bearing plantings, is 3-fold less than in Moldavia. There is a low level of production specialization and concentration in orchard, vegetable and potato raising in many regions of the nation. Product yield per hectare on the specialized sovkhozes, for example those raising vegetables, is 3-3.5 fold higher than on the nonspecialized ones. The lands planted with vegetable crops are still half dry-farmed while irrigation increases the yield, for example, of early tomatoes by 2 fold in Moldavia and for medium-early ones by 3 fold. The assortment of the grown products is limited. Cabbage, carrots and beets make up more than one-half of the total volume while not enough cucumbers, tomatoes, squash, eggplant, green peas and other crops are raised. This significantly impoverishes the diet and reduces the possibility of the processing industry to broaden the assortment of the products produced.

Hothouse farming helps to mitigate the seasonal factor and improve the supply of vitamins for the population in the winter and spring. However, this system is not sufficiently developed. At present per inhabitant of the RSFSR there is 0.2 m^2 of winter and spring hothouses and there should be 4 fold more.

The increase in the yield is substantially influenced by biological factors and primarily plant breeding and seed raising. In recent years a number of new high quality vegetable varieties and hybrids have been developed including: the "Novinka Pridnestrov'ya"tomatoes with a yield up to 9 tons per hectare, the "Podarok" tomato with a dry matter content up to 7 percent, the "Biruintsa" and "Kolkhoznyy," the sweet pepper "Podarok Moldovy" with a yield up to 70-80 tons per hectare and others. However, their introduction has been going on slowly.

New industrial growing methods have been worked out and recommended for the major vegetable crops and their introduction substantially increases the yield. The mechanization of growing and the harvesting of white cabbage under the conditions of the Nonchernozem Zone makes it possible to obtain a guaranteed crop of at least 600 quintals per hectare and reduce production expenditures by 2.0-2.5 fold. The changeover to the commercial growing of green peas, tomatoes, green beans and other crops increases labor productivity and reduces product costs.

Serious shortcomings exist in potato production. Few early potatoes are grown and the late varieties possess poor taste qualities. Starting in the 2d half of the 1950's and until recently, there has been a continuous decline in the starch content of the potatoes received for industrial processing. In the RSFSR this has declined from 15.4 percent as an average for 1966-1970 to 12.6-13.4 percent in 1976-1980.

Many regions of the USSR possess favorable natural and climatic conditions for the development of orchard-raising. However the area under fruit-bearing orchards has gradually declined, particularly on the kolkhozes. As a whole for the USSR, among the fruit and berry crops the labor-intensive ones are the least; seed fruits comprise 71 percent, stone fruits are 21 percent and berries around 4 percent. The dominance of seed-fruit crops among the orchards in the southern regions is one of the shortcomings in the development of orchard-raising. In a number of regions of the nation, high-quality varieties of apricots, peaches and cherries could grow and produce regularly. Among the seed-fruit crops, the proportional amount of the keeper winter varieties remains low (as a whole for the USSR, the proportional amount of winter apples is 54.5 percent and winter pears 20 percent). There is a low proportional amount of berries marked by early ripening and thus extending the fruit consumption season.

The losses of fruit and vegetable products are unjustifiably high. Due to the imperfection of harvesting machinery and the transport and storage methods, a significant amount of product is lost or used as livestock feed.

What Must Be Done for a Sufficiency of Fruits and Vegetables

In working out the specific comprehensive program for the development of the fruit and vegetable complex over the long run, it is essential to answer the basic question of whether the USSR, with rather unfavorable soil and climatic conditions, can supply the population with a diverse assortment of high-quality fruit and vegetable products in accord with the recommended standards. Calculations indicate that this question can be answered affirmatively. In the aim of successfuly reaching the planned production and consumption levels, the fruit and vegetable subcomplex should be developed in the following basic areas.

In vegetable raising, along with creating specialized suburban zones which supply the cities and industrial centers with fresh vegetables raised on open and covered ground, it is essential to have large zones which produce vegetables on a wide scale both for delivering them to the northern regions of the nation in a fresh form as well as for processing into finished or semifinished products.

The required amount of vegetables can be supplied chiefly by increasing the yield on the basis of intensification and deepening production specialization. Over the long run it is essential to provide for a changeover to the predominant growing of vegetable and melon crops on irrigated lands and to more rapid rates for producing vegetables on covered ground. The development of covered ground should be carried out in two areas: the building of specialized complexes around the large cities and industrial centers in all the climatic zones for consuming the product on the spot and the construction of combines in the southern regions with the better climatic conditions for shipping the products to the cities of the Nonchernozem Zone, Siberia and so forth in the December-May season. Their highest concentration should be in the Central Asian republics, Kazakhstan as well as in the south of the Ukraine, the Northern Caucasus and Central regions of the RSFSR and in Moldavia. The designated republics and economic regions should produce more than 70 percent of the vegetables grown on covered ground.

It is essential to introduce new varieties and hybrids for open and covered ground, in possessing resistance to diseases and pests, suitability for mechanized growing and harvesting, good keeping qualities and transportability, high food, taste and processing qualities and a varying degree of quick ripening; they should also provide for even maturing over the harvesting season. For the berry and stone crops, it is desirable to develop varieties suitable for mechanized harvesting.

Attention should also be paid to the proposals to utilize continuous hydroponic growing of cultivated plants, providing for conveyor production in containers. Such methods provide a productivity that is 50-100-fold above the productivity of traditional crop raising.

For increasing potato production efficiency, there must be further specialization of the potato-growing farms under the most suitable soil and climatic conditions as well as the organizing of isolated farms to grow the elite and varietal potato seed on a virus-free basis. The basic regions for largely market potato production are the Nonchernozem Zone, the Volga area, the Urals, Western Siberia and so forth. In the southern regions it is advisable to grow only early potatoes. For covering the shortage of food and seed potatoes in the south of the nation, they should be shipped there from the above-listed regions.

Colossal reserves are to be found in the possibilities of modern biology. The abandoning of the vegetative method for reproducing potatoes in favor of the seed one (certain scientists, for example Yu. G. Trinkler in Gor'kiy, are working on this) could provide the national economy with additional resources amounting to around 20 million tons of potatoes a year. Over the long run it is essential to convert to the specializing of farms in producing table and feed varieties of potatoes as well as industrial varieties with a high starch content for the starch-molasses and alcohol enterprises.

It is essential to increase the level of mechanization in vegetable, potato, orchard and grape-raising. The labor intensiveness of vegetables grown on open ground surpasses the labor intensiveness of grain production by 5-fold, while for potatoes the figure is 2.3-fold. The labor intensiveness of grapes, fruits and berries is even higher. A large portion of the labor expenditures goes for harvesting work. The mechanizing of harvesting is the central problem in the further development of orchard, vegetable, grape and potato-raising.

Regardless of the engineering difficulties, definite advances have been made in mechanizing the harvesting of fruit and vegetable products. Potato-harvesting combines have been developed and put into production; machines are being developed for the harvesting of grapes and these replace the labor of 60-70 pickers. Machines are being tested also for the harvesting of fruits and berries. However, the number of them is still insufficient and the designs are imperfect. Promising are the self-propelled four-row hydraulic-operated potato-harvesting combines which are suitable for use in various soil-climatic zones and have an automatic system for selecting the optimum speed and operating conditions of the separators. The combines harvest the tubers with minimum damage without expenditures of manual labor and have a productivity that is 3-4-fold higher than the existing machines.

Considering that the amount of putting down of potatoes for storage on the producer farms will increase, thought must be given to the creation of storage facilities supplied with a range of machinery and equipment for receiving the tubers and preparing them for storage. In vegetable-raising the self-propelled broad-reach harvesters should be employed, both new as well as improved existing ones, for the harvesting of tomatoes, table root crops, cabbage and onions.

The harvesting of grapes requires 20-35 percent of the labor expenditures on growing the crop. With an average harvest rate of 3-3.5 quintals, more than 500,000 persons are employed for a month in harvesting. Over the long run the number of persons employed in manual grape picking will exceed one million persons. Since basically the vineyards are located in areas with a taut labor-resource balance, the only solution can be a changeover to combine harvesting methods for the grapes to be used for further processing. Even now a number of successful designs have been developed, including the "Kubin-1" combine which is now being tested in the vineyards of the Northern Caucasus and Crimea. It is essential to develop series production of the most successful designs, carrying out parallel work on their further improvement.

The existing system for the purchase, transporting, storage and delivering potatoes, fruits and berries to the consumers is imperfect and causes high product losses. Mechanized harvesting of the basic portion of the crop would place great demands on the storage conditions for the fruit and vegetable products.

In the aim of reducing losses and increasing the resources of the fruit and vegetable products, over the long run it is essential to increase the following: the amount of potato and vegetable storage under the conditions of forced air ventilating; the scale of storing and transporting potatoes and vegetables in containers; the storage volume of fruits and vegetables using artificial refrigeration in an environment which is automatically controlled in terms of air temperature, humidity and gas composition; the use of fundamentally new methods for storing the fruit and vegetable products.

Around 40 percent of the vegetables and 30 percent of the fruits which cannot be stored in a natural state should undergo processing. The total production volume of canned goods by 1990 will rise by 1.5-1.6 fold in comparison with 1980, and production should increase more rapidly for the natural canned goods, fruit and vegetable juices, jams, green peas and particularly the special children's canned goods as well as the canned and frozen semifinished products.

The agroindustrial associations should include automated canneries with special shops to produce quick-frozen products. The working out of the plans and the building of such plants is a task of the immediate future. New technologies should also be widely developed. These include: aseptic canning of liquid and pureed products, the canning of juices by the freezing method, dehydration by the sublimation method as well as new physical and chemical methods for processing raw materials using super high frequency energy, ultrasound, enzymes, ultrafiltration and so forth.

A fundamentally different organization in the production and supply of the nation's population with processed fruit and vegetable products is advisable. With this variation, in the raw material producing zone located basically in the South, large scale production should be organized for frozen semifinished products as well as products obtained by the aseptic canning method, with their delivery to the major industrial regions of the Center, the Urals and the eastern regions of the RSFSR where the ready-to-consume product will be prepared.

Rapid freezing of fruits, vegetables and potatoes has a number of advantages in comparison with the presently prevailing heat canning method. Quick-frozen products maintain their structure, nutritional value and taste properties while their assortment is rather broad. The use of quick-frozen food products and ready-to-eat dishes creates the prerequisites for manufacturing products which are balanced in terms of the content of useful components in accord with the requirements of a rational diet.

In producing quick-frozen food products, losses are significantly reduced and the need for scarce packaging is lowered. In transporting them the rail transport is more efficiently used and there is no need for escorts to accompany the products in the winter season. Quick-frozen products open up new opportunities to supply food products for the northern regions of the nation.

Also enticing is the use of the permafrost regions of the European and Asian North and the zones of the BAM [Baykal-Amur Mainline]. Here it would be possible to build ice storage facilities and store the frozen products in them. The proposed system for the transporting and storage of food products under the conditions of the North will be relatively cheap. Preliminary calculations indicate that the freezing and transporting of one ton of fruit and vegetable products over a distance of up to 3,000 km, in comparison with heat sterilization, provides a savings according to the reduced expenditures (considering the related sectors) amounting to 12 rubles.

An important problem is the optimizing of the assortment of canned goods produced by industry. The demand for many types of them is not fully satisfied. Only 5 percent of the tomatoes is employed to produced natural canned goods, whole-canned marinated tomatoes and other types of popular products. Over the last 20 years, the production of jams and jellies has declined by 2 fold and for stuffed vegetables by 4 fold. The types of products of increased popularity require significant labor intensiveness. At the same time the production of tomato paste, puree and juice, where labor intensiveness is significantly lower, has grown at a more rapid rate. Obviously under the conditions of the manpower shortage, the focus on producing an end product which is popular with the public should be reinforced by increasing the output of equipment which can fully mechanize all the labor-intensive work.

An equally important problem in improving the intercomplex ties is better supply of the fruit and vegetable farms with crating and packaging materials. The existing stubborn shortage of tin plate, wooden packaging, polymer films and polymer containers, glass jars and bottles in a number of instances is the inhibiting factor for increasing the production of fruit and vegetable canned goods, frozen and other types of products. Over the long run it is essential to provide for the accelerated introduction of progressive types of tin, polymer and combined packaging and packaging materials as well as types of caps. This poses new tasks for the chemical industry, ferrous metallurgy and a number of other industrial sectors.

A special place is held by the question of creating an industry for processing potatoes into ready-to-consume food products. The USSR holds one of the leading places in the world in terms of the level of per capita potato production and consumption. However, the basic portion of the potatoes is supplied to the public in a natural form. The storage of potatoes over a long time substantially reduces its taste qualities and leads to significant losses. Each year around 20 percent of the volume of purchases is wasted; in a number of instances 30-50 percent of the potatoes sold to the public is lost as waste.

For solving the problem of supplying the public with potatoes and reducing their losses, it is essential to organize large-scale production for processing potatoes into cutlets, dumplings, frozen potato garnish, dry puree and flakes. In the developed capitalist nations, the production of potato products has become widespread. In the United States, where per capita potato consumption is 2.3-fold less than in the USSR, around 45 percent of the potato crop goes to produce potato food products while per capita output of frozen potato products has reached 6 kg. In the United States, England, the Netherlands and a number of other nations, the production of potato products has become a sector of the food industry. There are also rather striking examples of efficient methods for bringing the potato to the consumer in the socialist nations. In the GDR, Poland and Czechoslovakia the practice of supplying peeled potatoes to dining rooms, cafes, restaurants, hospitals, school and trade is becoming evermore developed.

The production of potato products which started in the 1960's in the USSR has still not gained proper development. There is only one specialized enterprise, the potato products plant in Moscow, and a number of shops at vegetable drying enterprises. The problem of bringing the potatoes to the consumer with minimum losses has assumed particular urgency because of the increased urban population and the rise in the standard of living, the change in the social way of life and the necessity of sharply reducing labor expenditures on preparing food at home. For creating the new sector of the food industry, it is essential to set up a broad network of specialized market potato farms and develop series production of highly productive equipment for its processing.

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PROBLEMS OF ORCHARD-RAISING IN SIBERIA REVIEWED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA in Russian No 6, Jun 82 (signed to press 16 Apr 82) pp 78-85

[Interview with I.P. Kalinina, director of the Scientific Research Institute for Siberian Orchard Raising imeni M.A. Lisavenko under the Siberian Division of the VASKhNIL (Barnaul), Corresponding Member of the VASKhNIL and winner of the USSR State Prise, by V. Lavrov: "The Commercial Orchards of Siberia"]

[Text] EKO [this magazine]: How do you Ida Pavlovna [Kalinina], view the situation in the supply of fruits and berries for the Siberian population?

[Answer] Even the problem of supplying meat products for the Siberians has become less acute. A per capita average consumption standard has been set for fruits and berries and this is 112 kg. Siberian scientists are in favor of a higher standard of 120-130 kg. But actually each Siberian and Far Easterner as well consumes per year...12 kg of berries and fruits. This includes the products grown by us, those shipped in from other regions of the nation or from abroad. For no other food product is there a such a discrepancy between the scientifically based consumption standards and average actual per capita consumption. For all types of products Siberia is increasing the production volumes but the situation is virtually unchanged for the production of fruits and berries.

EKO: Is Siberia rich in orchards?

[Answer] Yes and no. While in 1920, over the vast territory from the Urals to the Pacific Ocean, orchards occupied an area of 300 hectares, at present their area is 100,000 hectares. This is a lot if we compare it with the figure 60 years ago. But it is little if we compare it, for example, with the area of arable land. In the Altay alone there are 5 million hectares of plowed lands but just 17,500 hectares under orchards.

In the zone of our institute's activities there are 81 specialized orchard farms. Each of them has commercial-type orchards which produce a large volume of product. Many Siberian sovkhozes and kolkhozes have consumer-type orchards with an area up to 50 hectares. These are often in a neglected state, they bear poorly and operate at a loss.

We consider the collective and farmstead orchard plots to be a very promising direction for the development of Siberian orchard raising. Some 1.5 million families in the cities and countryside have them. Their area comprises around one-third of the total area planted under orchards in the Urals, Siberia and the Far East.

EKO: So up to now orchard-raising in Siberia has developed extensively. In addition, the specialized farms are now under two ministries-agriculture and fruit and vegetable production. Is this not the case?

[Answer] In principle orchard-raising in Siberia could not develop intensely. In the nations there are regions with an old history for the development of orchard-raising but here the first attempts to raise fruit crops were made in the middle of the last century. Considering the harsh natural and climatic conditions, the scientists had to develop winter-resistant varieties of fruit and berry crops (18-20 years are needed to develop each variety) as well as develop the techniques for their multiplication and growing.

At present, the Siberian orchards have a rich assortment of crops which is constantly being added to. The plant breeders of our scientific research institute alone have developed more than 140 varieties, 47 of which have been regionized in 75 krays and oblasts of 6 Union republics. Thus, Siberia is already influencing the development of all domestic orchard-raising. With the help of the state testing areas in the European USSR, we have regionized the Altay varieties of black currant in the Nonchernozem Zone, in Belorussia, the Baltic, Kazakhstan, the Ukraine and Caucasus.

We deliver large amounts of planting stock of the best varieties of currant, raspberry and sea buckthorn to many farms of the nation as well as for export. During the Tenth Five-Year Plan the institute sold 32 million seedlings and sets of fruit and berry crops.

Hence, it can be said that Siberia has gone through a period of initial accumulation and now possesses its own good varieties of fruit and berry crops and has its orchard-raising sector. Unfortunately, the latter has not developed to that degree which is required for good supply for the population.

EKO: Why in the stores of Siberian cities are there just cans with jams shipped in from afar? Fresh locally produced berries and fruits are found only on the [free] market. What is the actual way that local orchard products reach trade and the processing industry?

[Answer] Our institute has constantly been against the use of the already not too large amount of fruits and vegetables produced in Siberia for winemaking. These products are needed by us in a fresh form. Certainly in terms of their biological composition they are more valuable than those which are shipped here. Siberian apples contain more vitamins, sugar and amino acids than those shipped in from our southern regions as well as from Bulgaria or Hungary. The juices obtained from Siberian fruits and berries possess superior quality and the compotes are on a level of the best world standards. Siberian orchard products can compete on the domestic and foreign markets.

However, the largest amount of these products is used to manufacture low-proof wines although the products from the southern orchards could be used as a raw material for them if this is necessary. Such a situation has developed because Siberia does not have a single state plant for processing fruits and berries into food products. There are only processing shops on the Michurinets and Flora sovkhozes in Altayskiy Kray and sovkhozes in Novosibiriskaya oblast. The kray (oblast) consumer societies operate small shops for processing fruit and vegetable products. But this microscopically small industry is not oriented at producing juices and canned goods. The managers consider that wine production is more advantageous.

It is not difficult to produce jams from overripe or slightly damaged fruits and berries. This does not require great effort in harvesting, special transport or good refrigeration.

Siberia could have, for example, unique and large-scale production for the processing of sea buckthorn and this would satisfy the needs of both the Siberians and the inhabitants of other regions of the nation and could also operate for Soviet exports.

EKO: Are there sufficient raw material resources for such production?

[Answer] Completely enough. Until recently the sea buckthorn was just a wild plant. The institute developed the world's first cultivated varieties. They differ from the wild forms in the lack of thorns, larger berries and a higher content of biologically active substances. The cultivated sea buckthorn produces good, stable harvests with ordinary farming practices. Just out the window you can see a planting of them, something more than a hectare. In 1981, here we harvested 13 tons while in the previous 5 years the harvests had not been under 10 tons. Here we have not done anything which any farm could not do.

On the the Barnaul'skoye Experimental Production Farm, the average crop is approximately the same while the best varieties produce up to 25 tons per hectare. Virtually all the Barnaul residents could supply themselves with sea buckthorn fruit (not more than 10 kg per family), if they would agree to the self-harvesting method. On the Barnaul'skoye Experimental Production Farm and on the Tsvety Altaya and Yagodnyy sovkhozes we were forced to resort to such a harvesting method. It is not bad and is also employed on the sovkhozes of the European USSR.

In Altayskiy Kray there is the specialized Sibirskiy Sovkhoz of the Ministry of Medical Industry. It has 500 hectares of sea buckthorn. Next to it is the Biysk Technical Forestry School which also supplies raw materials to the Biysk Vitamin Plant where a medicinal sea buckthorn oil is produced. The medicinal preparations are essential but also sea buckthorn is needed in a fresh form and there must also be a natural juice from it and canned goods. For example, the Flora Sovkhoz produces a small amount of a magnificent product, sugar-coated sea buckthorn. And how good is a mixture of sea buckthorn with carrots!

The sea buckthorn is spreading wider and wider. Commercial plantings exist in Novosibirskaya Oblast and Buryatia. However, as yet the stores do not have sea buckthorn either in a frozen form or any other, although there are great opportunities.

Much sea buckthorn still remains on the trees and it is harvested using hooks, and takes a very long time, a month, while it should be harvested in a week. On the plantings of our institute there is rather rigid control over the quality of harvesting but this does not exist on the kolkhozes and sovkhozes.

The organization of large-scale industrial production for the processing of sea buckthorn would necessitate a more economic attitude than we have as well as more rapid development of specialized farms.

EKO: What is the situation with other fruits and berries?

[Answer] The Siberian commercial orchards could produce up to 30 tons of apples per hectare. Raspberries and strawberries also produce good crops. Without changing anything, and merely by observing elementary farming practices, according to the institute's data, from each of 100,000 Siberian orchard hectares it would be possible to obtain an average of 5 tons of fruits and berries. As yet, not more than a ton has been produced. Not only are the climatic conditions to blame. On many small orchards, the crop is not harvested at all justifying this by the lack of manpower. Unfortunately, many leaders are not seriously interested in this sector and they underestimate the importance of orchard-raising as one of the sources for solving the food problem.

Changes are also needed in planning and organization. Certainly the party and soviet bodies are very demanding about the grain which has sprouted under the snow but no one has ever been seriously held responsible for the unharvested crop of currants, apples and sea buckthorn. And what about the lack of manpower during the peak of harvesting? Thousands of urban dwellers sit home by their TV sets for the two days off a week. Don't they need berries or do they prefer to buy them at high prices on the open market. I feel that the population could be organized for the harvesting of fruits and berries, but who would be in charge and who would provide transport? If we want to have Siberian fruits and berries in the stores as well as good canned goods from them, then this must be given as much attention as vegetable-raising.

EKO: It would obviously be simpler to ship in good compotes from Bulgaria, apples from Hungary, grapes from Azerbaijan and Georgia, pineapples from Africa and oranges from Morocco.... How do you, Ida Pavlovna, view the so-called "green bridges" which can supply the Siberians? Can we provide everything ourselves?

[Answer] The deliveries of fruits and berries to Siberia should grow, and above all those which do not mature here. From our own production, by the year 2000, we will be able to increase fruit and berry consumption by approximately 4 fold, that is, we will still be far from the standard. This increase will occur only under the condition that orchard-raising becomes an equal sector of agriculture. We are in favor of developing any "bridges" over which fruits could be shipped to Siberia. At the same time the Siberians must consistently and rapidly settle the problem of developing orchard-raising, the processing industry and fruit and berry trade. Positive experience has been acquired in Altayskiy Kray, Omskaya and Novosibirskaya oblasts. Buryatia, Tyumenskaya, Tomskaya, Irkutskaya and Chitinskaya oblasts as yet possess only farmstead and collective orchards, although each oblast has zones which are favorable for commercial orchard-raising.

These zones must be properly used. In the Altay, basic orchard raising is concentrated in the piedmont and low-mountain microzones. The Michurinets Sovkhoz in the low-mountain area has 600 hectares of orchards and produces more fruits and berries than all the specialized sovkhozes of Plodoprom [Administration for Fruit Industry] located in the steppe and forest steppe zones, taken together. Upon our insistance, three other orchard sovkhozes have been created in the low-mountain area of the Altay. This same path must be followed in Krasnoyarskiy Kray. In the south of it, in Shushenskiy Rayon, it would be possible to obtain large apple crops. In such microzones, the development of a sector would not be detrimental. There are entire nations which exist by monocropping, and we should not resist this in the microzones.

Area of Fruit and Berry Plantings, 1,000 hectares

	Total		Bearing		On State Farms 1979	Individually Owned
	1976	1980	1976	1980		
Urals	37.4	37.1	22	20.6	12.5	24.3
Western Siberia	38.8	37.8	25.9	24.9	20.2	16.8
Eastern Siberia	10.3	9	8	6.9	3.9	5.1
Far East	14.7	14.3	10.3	9.9	6.3	8.3
Total	101.2	98.2	66.2	62.3	42.9	54.5
RSFSR	--	--	--	--	643.7	482.7

An example of the rationality of narrow specialization is the experimental production farms of our institute. They operate on full cost accounting, each year they have good profits, they grow large fruit and berry crops and provide a large amount of seedlings and sets.

Gross Harvest and Yield of Fruits and Berries in USSR Eastern Regions

	Gross Crop, 1,000 tons				Yield tons per hectare			
	1976	1980	Annual Average in Tenth Five-Year Plan	1996-2000 Proj.	1976	1980	–	Annual Average in Tenth Five-Year Plan
Urals	35.8	37.4	33.3	—	1.6	1.8		1.6
Western Siberia	25.6	40.3	31.6	234	1	1.6		1.2
Eastern Siberia	9.4	14.5	11.6	72	2.1	2.1	1.6	1.6
Far East	21.6	19.2	21	100	2	2	2.1	2.1
Total for Zone	92.4	111.4	97.5	—	1.4	1.8	1.5	1.5

EKO: What other organizational and economic conditions are needed to improve the fruit and berry supply for Siberia:

[Answer] Great hopes have been put on the newly organized ministry of fruit and berry production. It is a positive fact that this ministry brings together the production and sales of products as the fruit and vegetable marketing organizations have been turned over to it. A negative feature is that on the farms under this ministry, the main thing remains the production of milk, meat, grain and not vegetables, fruits and berries. However, we are hopeful that the attitude toward orchard-raising will still improve.

A more serious condition for increasing the production and consumption of fruits and berries is, I feel, the development of collective and farmstead orchard-raising. This is the fastest method for solving the problem. I myself and co-workers from the institute have often met with amateur orchard-raisers. They purchase the saplings from us and receive advice. From them we learn what can be grown in Eastern Siberia. In their majority they are infatuated with the process of raising plants. Of course, the product is also a goal because the state cannot provide their table with what they obtain from their plot. This is not easy labor. It is wrong to feel that once a person has a plot the money begins to pile up in the bank. On the contrary, money is needed for purchasing saplings, fertilizer, building materials and water supply. Areas unsuited for farming are provided for the collective orchards but the number of orchard growers is rapidly growing. The city dweller returns to the land. At one time he arrived in the city and has already forgotten how difficult it is to raise grain or livestock. This is all the truer for the children of a city dweller, but they also become acquainted with working on the land due to the orchards.

This is a good process and it must not be checked. On the contrary, it must be encouraged. Loans must be given, difficulties not put in the way for building huts, while the output and broad sales of small tractors, other mechanisms and garden tools must be organized.

With good work, an orchard-raiser with his 300 m^2 of land can have surplus products and the right to sell them on the market at the market price. This price is set depending upon the supply, upon the number of sellers and what exists in state and cooperative trade. We must not condemn the growers who sell their surplus fruits and vegetables produced on their own plot. This is remuneration for their difficult labor. High-quality products come from these orchards. They are consumed fresh or processed into natural canned goods and juices.

[Additional Information]

The Scientific Research Institute for Siberian Orchard-Raising imeni M. A. Lisavenko has two experimental production farms, the Barnaul'skoye and Gornoaltayskoye, employing 600 persons. In these unique experiemental shops, scientists develop new varieties of fruit and berry crops. On the 600 hectares, research is conducted on perennial plantings and seedling and sets are grown on 200 hectares.

Many processes in commercial orchard-raising have now been mechanized such as the preparation of the soil, planting, the tending of the saplings in nurseries, protection against diseases and pests, and inter-row tillage. But the harvesting remains manual and this impedes the development of the production of sea buckthorn, raspberries, currants and strawberries. A small mechanization section with six designers is working on the problem of mechanizing the harvesting of the berry crop. The leaders of the Scientific Research Institute feel that a design bureau is needed with experimental production to solve these problems.

In Siberia, the strawberry matures most rapidly, while honeysuckle is even faster. In a wild form honeysuckle spreads everywhere, but only the berries growing on Kamchatka are edible. The Bakcharskiy Experiemental Point for Northern Orchard-Raising (Tomskaya Oblast) has produced a form of honeysuckle suitable for commercial orchard-raising. Its berries aid the normal functioning of the cardiovascular system.

At present, 30 percent of the land occupied by orchards is held by the Siberian amateur orchard-raisers, but this land produces up to 60 percent of all the fruits and berries.

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